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From Neuroscientific Research Findings to Juvenile Justice Practice in Scotland

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Abstract

As a growing field of research, neuroscience receives more and more attention from lay people as well as professionals in various contexts. This ESRC funded dissertation investigates how neuroscientific research findings influence juvenile justice practice in Scotland. The study concentrates on the aspect of aggressive behaviour in children and young people. The thesis begins by reviewing juvenile justice practice in Scotland. This is followed by an overview of key neuroscientific research findings possibly relevant for juvenile justice practice. Further context for this dissertation is provided by a review of the theoretical frameworks for understanding how practitioners use knowledge with particular reference to knowledge production and transdisciplinarity in social work. The thesis then moves on to an empirical analysis, based on a case study approach employing qualitivative data collection methods in addition to a discourse analysis of relevant neuroscientific research publications. The empirical chapters explore different aspects and perspectives of the process, by which neuroscientific research findings move from a scientific paper to juvenile justice practice. The conceptualisation of aggressive behaviour in the different social worlds of juvenile justice practice and in neuroscientific research publications is examined, and aggressive behaviour is identified as a boundary object that spans the analysed social worlds. The perspective of training providers and practitioners on the utilised neuroscientific knowledge is explored. The conceptualisation of neuroscience is then placed in the context of the day-to-day realities of juvenile justice practice, with the aim of understanding how this knowledge potentially changes practitioners' perspectives towards service users. The knowledge utilisation process is investigated, with focus on the different actors and their roles in a context of transdisciplinarity in juvenile justice practice. In conclusion, the thesis provides recommendations for knowledge providers, practitioners, policymakers and academics by considering ways of improving a critical perspective on knowledge from other disciplines; encouraging training providers and practitioners to become more active participants in this knowledge utilisation process; and by including the need for working environments where active knowledge utilisation is integrated in the work place.

STATEMENT OF AUTHORSHIP

This thesis has been composed by me, Christina S. Plafky. It is all my own work and has not been submitted for any other degree or professional qualification.

Signed: _____

Christina Sabine Plafky

Date: 21. August 2013

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TABLE OF CONTENTS

Page

Chapter 4 – Epistemological and Ontological Orientation

Chapter 5 – Methodology

Chapter 6 – Aggressive Behaviour in different social worlds

Chapter 10 – Conclusion and Recommendations

List of Tables

List of Figures

List of Appendices

Abbreviations

ADHD: Attention deficit hyperactivity disorder
ASBD: Antisocial behaviour disorder
CALM: Crisis, Aggression, Limitation and Management
CAMHS-fCAMHS: (forensic) Child and Adolescent Mental Health Services
CD: Conduct disorder
CJSW: Criminal Justice Social Work Centre
CLF: Continuous Learning Framework
CPD: Continuous professional development
CT scan: Computer tomography scans
CTA: ChildTrauma Academy
CU: Traits callous and unemotional traits
DISC- Schedule: Dominant, Influential, Steady and Conscientious Schedule
DSM: Diagnostic and Statistic Manual of Mental Disorders
EBP: Evidence-based practice
ECTS: European Credit Transfer and Accumulation System
ESRC: Economic and Social Research Council
GIRFEC: Getting it right for every child
HPA axis: Hypothalamus-pituitary-adrenal axis
ICD: International Classification of Diseases
NHS: National Health Service
NICE: National Institute for Excellence
NMT: Neurosequential Model of Therapeutics
ODD: Oppositional defiant disorder
PTSD: Post-traumatic stress disorder
SSSC: Scottish Social Service Council
SVQ: Scottish Vocational Qualification
UK: United Kingdom
WHO: World Health Organisation

1 Introduction

1 Introduction

The social problem of aggressive behaviour has become a very pressing issue in modern life. Regular media coverage about young people 'acting out' and committing violent acts is just one of many examples of the increased interest (Halsley and White 2008). Additionally, youth crime and particularly aggressive acts committed by young people continue to be a topic of debates amongst professionals and policymakers regarding appropriate ways of dealing with it. The debates reflect the contemporary political climate and the restraints, difficulties and uncertainties juvenile justice systems entail (Freeman 1983).

There is a constantly growing media coverage of neuroscientific research findings on human behaviour in general and aggressive behaviour in particular. Additionally, within the wider scientific community, neuroscience research seems to receive increasing attention and funding. On the other hand, an increasing number of publications that critically examine the influence of neuroscience on the policy debate are published (Bruer 1999; 2001; 2012; Wastell and White 2012). The general trend in social work services to increase evidence-based practice and a professionalisation of practice has led to a growing interest and funding in the field of knowledge translation, utilisation and transfer (Marsh et al. 2005).

This ESRC (Economic and Social Research Council) funded study tries to investigate, if and how, neuroscientific research has an influence on the practice with juvenile offenders in Scotland. It was hoped to gain an insight in the process of knowledge utilisation of the two seemingly unrelated fields of neuroscientific research and juvenile justice practice. This dissertation presents the findings, results and recommendations from this investigation.

2 Overview of the study

This dissertation starts with a summary of key concepts and studies, in order to place this dissertation within the theoretical literature. Chapter 2 begins with a review of the juvenile justice system in Scotland with reference to international guidelines and legislation. The chapter continues with a short summary of relevant statistical findings on youth crime in Scotland.

In Chapter 3, key neuroscientific research findings are presented which could be relevant to juvenile justice practice with aggressive young people. Here the following research areas are introduced: aspects of neurodevelopment, the relationship between cortisol and stress responses and aggressive behaviour, neurotoxins, brain imaging studies, neurophysiology, and gender studies. This then leads to a section that provides an introduction on neuroscientific research findings and their application in practice; where studies on the influence of neuroscience research on judges in American courtrooms (Aspinwall and Brown 2012; Weisberg and Keil 2008), and on professionals working with people diagnosed with antisocial personality disorder and psychopathy (Pickersgill 2011) are presented. This is followed by a review of the theoretical frameworks of knowledge for practitioners (D´Cruz, 2009; Farmer 2009; Lomas, 1993; Payne and Askeland 2001, 2008;

Trevithick 2008) in a context of the 'best practice' and 'evidence-based practice' agendas (Davies and Nutley 2000; Davies and Walter 2008; Davies et al. 2010, Nutley and Walter 2007; Nutley and Smith 2000). A further discussion links knowledge utilisation in practice to the debate around a professionalisation of practice. This is placed in the context of theoretical frameworks of knowledge production (Gibbons 1994) and transdisciplinarity of social work (Büchner 2001; Kleve 2000, 2003, 2006; Mittelstrass 2003; Obrecht 2002, 2003).

Chapter 4 summarises the most relevant epistemological considerations used in this study. A brief discussion of social constructionism and realism provides the basis for the following important concepts: a particular focus is placed on theories developed by Foucault on discourse and power (1989, 1980) and on Hacking's approach to 'making up people' and the 'looping effect' (Hacking 1995, 1999). This is completed by concepts from 'Science and Technology Studies', where concepts of black-boxing (Latour and Woolgar 1986; Latour 1999, 2001), social worlds (Strauss 1978) and boundary objects (Bowker and Star 2000; Star, Griesemer 1989) are highlighted. The new approach of 'Critical Neuroscience' (Choudhury and Nagel 2009; Choudhury and Slaby 2012; Slaby 2010) is also presented to round up the used theories and approaches.

Chapter 5 provides an overview of the qualitative research method based on a case study approach. This chapter also justifies the use of expert interviews and focus groups.

Chapters 6–9 then present the discussion of the findings of this study.

Chapter 6 concentrates on the conceptualisation of aggressive behaviour in the different social worlds of juvenile justice practice, knowledge provision and neuroscientific research publications. The chapter finishes by establishing

aggressive behaviour as a boundary object across the analysed social worlds (Bowker and Star 2000; Star and Griesemer 1989).

Chapter 7 focuses on a critical examination of the work of Dr. Bruce Perry (and colleagues) (1995, 1997, 2001, 2002, 2006, 2008, 2009), a key figure in providing neuroscientific knowledge to practitioners in Scotland. The perspective of training providers and practitioners on the utilised neuroscientific knowledge is explored by focusing on the way this knowledge is used in practice.

Chapter 8 explores how neuroscience is conceptualised by practitioners and training providers. The conceptualisation of neuroscience is then placed in the context of the day-to-day realities of the work of practitioners and how this knowledge then potentially changes the perspective and view on service users.

Chapter 9 provides a discussion on the knowledge utilisation process in this context, with a specific focus on the different actors and their roles. The chapter further explores the knowledge utilisation practice in the context of transdisciplinarity.

Chapter 10 completes the study by providing a summary of the key findings and reflections on methodology. Recommendations for knowledge providers, practitioners, policymakers and lecturers concludes this investigation.

2 Juvenile Justice in Scotland

1 Introduction

This chapter gives an overview of the juvenile justice system in Scotland by introducing concepts of welfare, punitive and restorative approaches to youth crime. Additionally, the international context of juvenile justice is portrayed. The Scottish system is then discussed and the most important policy documents and legislation are introduced. The latest statistics on youth crime in Scotland and relevant findings from the Edinburgh Youth Study conclude this section.

2 General approaches to juvenile justice

In a youth justice system the focus is usually on 'delinquency'. This term has a long history and incorporates various different concepts and ideas of a period of biological age, which are sometimes contradictory and not clear (Muncie 2004). Archard argues that 'the modern child is an innocent incompetent who is not but must become an adult', which implies that children 'cannot enjoy the rights and responsibilities of adults' (Archard 2004: 50). On one side, this means that delinquent children are seen as victims in need of protection and support; and on the other side, there is a society that needs protection from these young people

(Kerner 2008). Additionally, there is an understanding that 'youth is the most criminogenic age' (Muncie 2004: 19). These characteristics result in a certain tension, and consequently, in different approaches, perspectives and aims, how a youth justice system should be constructed. Depending on the legal system and the political, moral and philosophical reasoning behind this, juvenile justice systems can be divided into welfare, punitive and restorative approaches. The following section will give a brief overview of these approaches.

2.1 A welfare approach in juvenile justice

The welfare approach aims to address issues that lead children and young people to offending behaviour and believes in change or control of behaviour (Hill and Tisdall 1997). This incorporates a characterisation of children who are vulnerable and in need of protection. Further, these children are seen to be troubled or troublesome and depraved or deprived (Hallet and Murray 1998; Abercrombie and Hill 2000). The welfare approach is child centered and acknowledges that children are developmentally at a different level to adults. This means that children are not made fully accountable for their wrongdoing and well-being. Additionally, social integration, and therefore the promotion of a change in behaviour, is the main goal. This has led to increased criticism, particularly from the public as critics argue that there is not enough done to ensure the protection of the public (McGhee et al. 2002).

Within a welfare approach, professionals assess the person and their individual circumstances. The assessment discusses the young person's profile, family history, life-style, childhood circumstances, and belief systems. Additionally, the offending behaviour, as well as risk factors and protective factors within the young person and his or her family are analysed (Scottish Government 2002).

2.2 A punitive approach in juvenile justice

In contrast, juvenile justice systems based on a punitive approach; focus on the crime and the offence rather than the background and social circumstances of the child or young person. Thereby evidence of the crime is assessed and leads to consequences. Risk management and special interventions and techniques to control, monitor and manage young offenders and their behaviour are used as standard practice (Smith 2007). The crime is punished with a determinate sanction. Muncie states, that

> justice-based models stress the importance of rights (the liberal version) or self responsibility (the conservative version). In both, the intervention is aimed at tackling the offence, rathen than its mitigating circumstances. (2004: 302)

Within a punitive approach, delinquency is defined 'as a matter of opportunity and choice' (Freeman 1983). As a consequence, reactions to criminal behaviour are therefore based on sanctions and control (Muncie 2004).

2.3 A restorative approach within juvenile justice

The restorative approach involves the young person in a way that encourages taking responsibility for actions more than the punitive or welfare approach seem to do (Haines and O'Mahony 2006). Restorative justice approaches ideally include all parties affected by the offending behaviour. An example is offender-victim mediation. 'Participation of the parties is an essential part of the process that emphasizes relationship building, reconciliation and the development of agreements around a desired outcome between victims and offender' (United Nations 2006: 6).

3 Juvenile justice in the international context

International conventions and standards such as the European Convention on Human Rights (ECHR), the Minima Rules on the Administration of Juvenile justice, 1985 (the 'Beijing Rules'), the Directing Principles for the Prevention of Juvenile Delinquency, 1990 (the 'Riyadh principles') and the Minima Rules for the Protection for Minors Deprived of Liberty, 1990 (the 'Havana Rules') give guidelines to laws, legislation and policies (Whyte 2009). An important aspect is the definition of 'juveniles', as stated by the United Nations as 'a child or young person, who under the respective legal systems, may be dealt with for an offence in a manner which is different from an adult' (The Beijing Rules 1985). The UNCRC (United Nations Convention on the Rights of the Child) was ratified by the UK government in 1991 (Article 12, Scotland 1998). The ratification includes certain reservations to specific points of the UNCRC. Scotland adopted the UNCRC in 2008 and these therefore influence the juvenile justice system. Although the guidelines of the UNCRC are binding in the international law context, as 'there is an obligation to comply with its principles and provisions. However, the Convention has yet to be enshrined in domestic legislation' (NACRO 2002). An example here is the age of criminal responsibility, which still varies considerably across different countries.

In 2005, the Committee of Ministers of the Council of Europe decided to pursue and strengthen its legislation towards a 'child-friendly justice' in the context of 'building a Europe for and with children' (Council of Europe[1]). These guidelines strengthen the rights of the child and support approaches that are child centred and respect aspects of child development:

> The overwhelming majority of children in conflict with the law should be dealt with and supported through a range of diversion systems and extrajudicial measures that recognise the causes of their behaviour and identify strategies at the community level to effectively prevent reoffending. (Ministers' Deputies 2008: 20)

The Scottish system is generally in line with these guidelines. Some aspects of the different legislations, measures and practices in Scotland are described over the next few paragraphs.

4 Governance and juvenile justice practice in Scotland

In Scotland, a focus is placed on welfare approaches; however, punitive and restorative aspects are part of the juvenile justice system (Burman 2008). The Scottish Children's Hearing System is based on the so-called Kilbrandon philosophy. Kilbrandon suggested in 1964 that

> children who were involved in offending or who were in need of care and protection … stemmed from the same source, namely failures in the normal upbringing process and/or broader social malaise (Kilbrandon 1964).

As a consequence, the Scottish system is based on 'diversion': this means a re-direction or re-routing of the alleged offender into another system (Whyte 2009). McAra argues:

> Research continues to be supportive of core elements of the Kilbrandon philosophy and in particular its holistic approach to troubled and troublesome children, the links made between social malaise and offending and the need of support to be offered in ways which do not stigmatise recipients. (2006: 142)

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[1] http://www.coe.int

The youth justice system in Scotland is centered on the Children's Hearing System; the legal basis for the adult criminal justice system is the Criminal Procedure (Scotland) Act 1995 as amended by subsequent legislation including the Criminal Justice and Licensing (Scotland) Act 2010, which makes new provision for community disposals and criminal justice social work.

In Scotland, 'a child under the age of 8 years cannot be guilty of any offence, as they are considered to lack the mental capacity to commit a crime' (Burmann 2008: 445). Scotland has been criticised by the UN Committee for the low age of criminal responsibility (namely eight years), particularly in comparison with other countries (Article 12, Scotland 2009). Although the age of criminal responsibility is low, the Scottish system refers children at least until 12 years old to the Children's Hearing System.

> Children between the age of eight and 12 cannot be prosecuted in the criminal courts but can be referred to the hearings system on both offence and non-offence grounds. Children aged 12 or more can be prosecuted in the criminal courts (subject to guidance of the Lord Advocate on appropriate cases). (Burmann 2011: 3)

There are only a small number of cases (usually very serious offences), were juveniles aged 14-15 are prosecuted in courts (McCallum 2011). 'Although the Hearing System […] can deal with young people up to 18 years, in practice most of those of 16 years are referred by the police to the Procurator Fiscal (PF), and from there to the adult system.' (Burmann 2008: 444). However, '…this does not mean that the child will be treated in the same way as an adult following any conviction' (McCallum 2011: 15). For example, cases can be remitted to a Children's Hearing for disposal and advice can be sought from a hearing. Additionally, children can be sentences with fines; community payback orders and so forth (McCallum 2011).

In summary, usually, offences are dealt with through the Children's Hearing System until the age of 16 years; although this can be extended until the age of 18 years under certain circumstances. The police have the following options for dealing with young people: a formal warning, a referral to the Children's Reporter and a referral to the Procurator Fiscal (for serious offences) (CJSW 2011). Therefore, the police have a high level of discretion in decision-making (Burman 2008). The Procurators Fiscal are employees of the Crown Office, and Children's Reporters are employees of the Scottish Children's Reporter Administration, which is a non-departmental public body financed by the Scottish Government Education Department. They have similar roles in the two systems and make decisions about whether to prosecute – the latter charged with acting in the best interests of the child. They are responsible for the organisation of the hearing. The Procurator Fiscal then has the power to decide about diversionary actions such as public warnings, monetary penalties, conditional offers or referrals to diversionary programmes (Burman 2008). Otherwise, the Court System deals with offences in the same way that offences committed by adults are dealt with (Criminal Justice and Licensing (Scotland) Act 2010).

The Scottish Children's Hearing System is legislated through the Children´s Hearing (Scotland) Act 2011 (The National Archives), which is in force since the 24th June 2013, and therefore replaces the Children (Scotland) Act 1995. A children's hearing panel consists of three lay panel members who have undertaken specialist training in preparation for this job (SCRA 2008). The children's hearing panel does not make decisions about innocence or guilt, however, the child or young person and his or her family is required to agree or disagree with the grounds of referral. In cases where the family decides to disagree, the hearing cannot be continued and the grounds need to be established through a Sheriff Court. In this context, this means for offence grounds, 'disposals of a hearing are not criminal penalties or sentences in any recognised sense' (Edwards 2001). Decisions made by the panel are usually

based on the ‘no order principle’ if it is decided that this is in the best interests of the child (The Children (Scotland) Act 2011, Scottish Office 1997).

Section 67 Grounds defines the reasons, why a children`s hearing in respect of a child or a young person can be held (previously called ’grounds for referral’). Examples here are that the child is beyond the control of any relevant person; is falling into bad associations; is exposed to moral danger; is likely to suffer unnecessarily; or is to be impaired in his health or development due to a lack of parental care (SCRA, Section 67 Grounds).

The options of the panel, which are relevant for this dissertation, are a compulsory supervision order which might include a movement restriction order, secure accommodation authorisation, a warrant to secure attendance, foster care, to name just a few.

Under certain circumstances, a Compulsory Supervision Order with secure accommodation authorisation (Section 83(6) of the Children (Scotland) Act 2011) can be made. Sections 83(5)(c), 87(3)(c) and 88(2)(c) of the 2011 Act specifies that the children's hearing or the sheriff may only make a secure accommodation authorisation if -

> (a) the child has previously absconded and is likely to abscond again and, if the child were to abscond, it is likely that the child's physical, mental or moral welfare would be at risk,
> (b) the child is likely to engage in self-harming conduct,
> (c) the child is likely to cause injury to another person.

The 2011 Act specifies that one or more of these conditions must be met to authorise the use of secure accommodation (Scottish Government 2013, Scottish Government 2012). Secure accommodation units can be defined ‘as a form of residential care for children in buildings which they cannot freely leave’ (Scottish Office 1997: 92). The

units are expected to have a catalogue of programmes developed for young people to support their development and promote a change in behaviour (Walker et al. 2005).

If a children`s hearing panel or a sheriff decide, that there are no other options than the inclusion of an authorisation of secure accommodation in the order, the implementation of the secure authorisation is decided by the chief social work officer and the head of a potential secure placement under the guidance of the regulations, whereby the Principle Reporter needs to be informed about the decision (SCRA 2011, The Secure Accommodation (Scotland) Regulation 2013).

The Scottish Government (Scottish Government 2011) has provided a direct alternative to secure accommodation as further disposal option for panel members: This Intensive Support and Monitoring Programme usually includes an electronic tag, a so-called 'Movement Restriction Condition' and a 24-hour support package (The Children's Hearings (Scotland) Act 2011 Movement Restriction Conditions Regulations 2012).

The Children's Hearing has no power to decide about a custodial sentence or communal penalties (Burman 2008).

Guidelines and Policies

The guidelines for policymaking and practice in the field of children and families and juvenile justice are stated in the Scottish Government Report: 'It is everyone's job to make sure I'm all right' (Scottish Government 2002). This has been updated to 'Getting it right for every child' (GIRFEC) (Scottish Government 2008). This framework also applies to the juvenile justice system and policymaking:

> It … is a new, national approach to supporting and working with all children and young people in Scotland. It affects all services for children and adult services where children are involved. It is based on research, evidence and best practice and designed to ensure all parents, carers and professionals work effectively together to give children and young people the best start we can and improve their life opportunities. (Scottish Government 2008)

This approach is guidance for all children and families services in Scotland. For practitioners, this approach was developed to help them

> focus on what makes a positive difference for children and young people – and how they can act to deliver these improvements. *Getting it right for every child* is being threaded through all existing policy, practice, strategy and legislation affecting children, young people and their families (Scottish Government 2009: 6).

On the homepage of the Scottish Government, there is specific reference made to the approach practitioners are expected to take when working with young people and children:

> - Putting the child or young person at the centre and developing a shared understanding within and across agencies.
> - Using common tools, language and processes, considering the child or young person as a whole, and promoting closer working where necessary with other practitioners.
>
> (Scottish Government 2008)

These guidelines are, in turn, influenced by the international guidelines described above. Over recent years, there was a trend to be tougher on crime in the UK. This has led to several debates about appropriate approaches: the 'evidence-based practice' and the 'best practice' idea seems to be widely accepted by policy makers and practitioners (Scottish Government 2012), and have also influenced the welfare approach in Scotland (McAra 2006).

The ‘ten point action plan on youth crime’ (2002) made several recommendations for practice focusing, for example, on improvement of the transition between the Children’s Hearing System and the Adult Court System, enhancing preventative and early intervention approaches to youth crime, increasing restorative justice approaches and providing a better link service portfolio for vulnerable children and young offenders within community, education and local authority services (Scotland’s Action Programme to Reduce Youth Crime 2002).

Elements of a more punitive and risk-management oriented trends like the ‘electronic tagging’ were included in the Scottish juvenile justice policy. For example, through The Antisocial Behaviour (Scotland) Act 2004, a Children’s Hearing Panel has the power to decide to restrict children and young person’s movement through an electronic monitoring tag (McCallum 2011). However, research has shown that the electronic tag usually is provided with an intensive support package, which, although the evidence seems to be contested in some respects, might have a positive impact:

> An electronic tag attached to the limb of a young person under the age of eighteen is not without value as an additional driver of behavior change when accompanied by dynamic and creative packages of community-based support delivered by skilled professionals. Yet in the absence of such support the case for EM becomes weak if not defensible from the perspective of those committed to the principle of rehabilitation. (Orr 2013: 7)

The trend towards more punitive approaches to youth crimes (McAra and McVie 2010) seems to have turned again and the focus currently is on ‘desistance from crime’ (Barry and McNeill 2009, McCallum and Frazer 2011, McNeill et al. 2012), which also manifests in the policy document ‘Preventing Offending by Young People - A Framework for Action 20007’ (Scottish Government 2008). This framework was developed by: ACPOS (Association of Chief Police Officers in Scotland); COSLA (Convention of Scottish Local Authorities); Safer Scotland

(Scottish Government); SACRA (Scottish Children's Reporter Administration); and the Crown Office and Procurator Fiscal Service (COPFS) - and shows different actors involved in the highest level of policymaking and governance in juvenile justice in Scotland.

McCallum states, that there is also an indication of the Scottish Government, to review how, for example, the systems, processes and practices deal with young people who offend as the goal is to reduce young people entering the adult Criminal Justice System (2011). The Reducing Reoffending Programme specifies the key areas of interest, which are diversion from prosecution; community alternatives to secure care and custody; risk assessment and risk management; young people in court; and under 18s in custody (Scottish Government 2012, Reducing Reoffending Programme). This programme also includes the 'Young People Who Offend Project' and states:

> Work within the project focuses on tailoring interventions and services to meet the needs of the young person, rather than fitting them into a service. There is no evidence or opinion to suggest that the project will adversely impact on this group.
> (Scottish Government 2012, Reducing Reoffending Programme)

The National Youth Justice Practice Guidance, accessible on the homepage of the Scottish Government[2], provides guidance, information and advice for practitioners working with juvenile delinquents on practice, policy, legislation and interventions.

The Scottish Centre for Crime and Justice Research (SCCJR), accessible on its homepage, 'is a collaboration of several Scottish universities. It aims to produce excellent research and to develop excellent researchers so as to better the

[2] http://www.scotland.gov.uk/

development of policy, practice and public debate about crime and justice' (SCCJR 2014).

Social work services, based in local authorities, provide assessments and programmes for young offenders and are involved with both systems, the Children's Hearing System and the Criminal Justice System. The assessor, usually a social worker, recommends intervention strategies and support measures for the young person to a Children's Hearing Panel or a Sheriff Court. Barry and McNeill argue,

> such methods of risk identification and prediction are often inaccurate but are nonetheless used increasingly to justify and determine the extent of intrusion into the lives of young people. Critically, this means that stigma is connected not only to what has been done by young people – for which they are to be held personally responsible as if in a social vacuum – but also to dubious judgements about what they may do. (2009: 200)

Generally, social work services offer programmes to young offenders which include: victim awareness programmes; anger management; drug and alcohol awareness training; as well as programmes to prevent reoffending. However, these services are regularly outsourced to voluntary agencies, for example, like INCLUDEM (Intensive Support for Young People in Need) and SACRO (Safeguarding Communities – Reducing Offending).

These different practices, programmes and trends also show how the Scottish Youth Justice System is trying to balance the need for protection of the public on one side and the need of the offending young person on the other side. The developments described above are constantly changing and evolving in order to stabilise the diverse needs of the involved groups of society. Barry and McNeill summarise this debate as follows:

> Too readily such systems exist or at least function so as to punish and to challenge individual young people rather than to question the extend to which the wider society is as much, if not more, to blame for the disadvantages young people face (2009: 202).

5 Statistic on youth crime in Scotland

A report published by the Children's Reporters Administration states that 'The high level of needs and multiple issues faced by the children supports the approach of the Children's Hearing System in looking holistically at the child and not just offending behaviour' (SCRA 2008: 49).

The Scottish Government has published a report on Youth Crime in 2005, which highlights that young people committed around 43% of all crimes and offences in Scotland in 2005. The report further states, that of the commited offences by young people under the age of 21, the majority of the crimes were fire-raising (86%), vandalism (75%), theft of motor vehicles (75%), theft by opening lockfast places (65%), handling offensive weapons (59%) and housebreaking (55%). The report further estimates that the under-15s commit over only one-third of youth crime, the majority of the crimes were commited by 18-21 years olds. The rest is attributable to those aged 16-17. Males committed the majority of the offences (87%).

According to the SCRA Online Statiscal Dashboard, there is a decrease in the rate of children referred to the Children's Reporter in Scotland since 2005-2006 (SCRA 2011/2012). For example, in 2010-11, 39.217 children were referred to the Children's Reporter under section 53 of the Children (Scotland) Act 1995; these are 65.824

referrals in total[3]. Of the total number of referrals of 17.667 children, there were 8.126 children (until the age of 17 years) referred for alleged offending (SCRA 2010-2011). The total numbers of referrals on grounds of offending behavior has gradually decreased from 2008-2009 from 26.251 to 12.831 referrals in 2011-2012. This is a reduction to less than half of the referrals over a 4-year period. It is, however, unclear where this reduction is actually coming from: is it due to an overall reduction in criminal behaviour by young people or is it, for example, because the police are referring fewer charges to the Procurator Fiscal (Burman 2008)?

> In 2011-12, 5.604 children aged between eight and 17 years were referred to the Reporter on offence grounds. These children were referred for 21.578 alleged offences on 12,831 referrals. The most common types of alleged offences were assault, vandalism and threatening or abusive behaviour. (SCRA Analysis Report 2011-2012)

Children who have been taken into custody can either be referred to the Reporter or the Procurator Fiscal. Following discussion with the Reporter, the Procurator Fiscal will decide whether to prosecute or refer to the Reporter (SCRA 2011-2012). For example, in 2011-2012, 261 custody referrals were made. These are for 192 of children with custody referrals (SCRA 2011-2012). The majority of the referrals were from Edinburgh, Glasgow, Highlands and North Lanarkshire.

In 2011-2012, there were 2.447 joint referrals made for 1.335 children. A joint referral means, that the police report cases to the Reporter as well as to the Procurator Fiscal. The majority of the children have been referred more than once. In 2011-2012, the Procurator Fiscal has referred 38 children with 31 referrals to the Reporters's office. The Sheriff Court has referred 165 children (165 referrals). 12.831 of the total

[3] A child may be referred to the Reporter more than once in the year on the same and/or different grounds. These totals count every child referred to the Reporter during the year once. This means that the sums may be greater than the totals (SCRA 2010/11: 3)

referrals were due to 5.604 children alledgedly commiting an offence. A reduction of the number of joint referrals to the Reporter and Procurator Fiscal can also be observed: the number of referred children has decreased gradually from 2.024 (SCRA, 2008-2009) to 1.335 (SCRA 2011-2012). However, the majority of referrals, namely 39.737 of the total referrals in 2011-2012, were on non-offence grounds.

As described above, children can be made subject of a Compulsory Supervision Order with secure accommodation authorisation (Section 83(6) of the Children (Scotland) Act 2011) or previously subject of a supervision requirement or a warrant with authorisation of secure accommodation (Section 70(10) of the Children (Scotland) Act 1995). For example, in 2011-12, 265 authorisations for secure accommodation were made. In 2008-2009 on the other hand, 347 authorisations were issued by Children's Hearings. A decrease in referrals to secure units is therefore observable over this period of time. Unfortunately, these numbers cannot be differentiated into offence grounds or other reasons for the accommodation in secure units.

During a Public Lecture at Scottish Association for the Study of Offending (SASO) on 5th March 2013, McVie has highlighted the lack of sufficient and reliable data on youth crime in Scotland (The Edinburgh Study of Youth Crime and Transition). It is therefore not possible, to give exact figures on the number of assaults or aggressive acts over a specific period. The reasons herefore lie in the two systems (Children's Hearing System as well as the Court System) and the fact that a lot of crimes are directly dealt with the police without referrals to either the Sheriff Court or the Children's Reporter.

The Edinburgh Study of Youth Transitions and Crime emphasises four key principles from their longitudinal research programme with a cohort of 4.300 young people in Scotland over a period of ten years:

(i) persistent serious offending is associated with victimisation and social adversity;
(ii) early identification of at-risk children is not a water-tight process and may be iatrogenic;
(iii) critical moments in the early teenage years are key to pathways out of offending; and
(iv) diversitonary strategies facilitate the desistence process.
(McAra and McVie 2010: 211)

Particuarly interesting for this thesis are the findings on violent offending behaviour: Evidence from this study suggests, that, for example, there is a correlation between violent behaviour and various other vulnerabilities:

> At the age of 15 years, according to the study, 15,23% of the respondents reported involvement in one or more episodes of violence, with boys (33%) being more likely to do so than girls (12%). Importantly, those involved in violent offending were the most vulnerable and victimised young people in the cohort (2010: 217).

6 Conclusion

This chapter has highlighted the most important political perspectives and contraints like the welfare, punitive and restorative approaches to youth crime as well as the guiding international and national principles underlying the Scottish youth justice system. Here, mainly the UN Convention on the Rights of the Child and the Ryad Principles are important. The complex Scottish system, based on the Children's Hearing System and Court System, were described. The underlying legislation was briefly summarised to clarify the different routes and options there are for young offenders. This now provides a theoretical framework of the day-to-day practice of juvenile justice practitioners in Scotland.

The chapter has also delivered some statistical background information on youth crime in Scotland.

Youth offending is a very complex issue that requires differentiated knowledge and skills of practitioners, embedded in a structured and complex approach of the youth justice system to tackle these issues in the best possible way (Whyte 2009).

3 Neuroscientific Findings, Knowledge and a Professionalisation of Practice

1 Introduction

The field of neuroscience is heterogeneous; indeed the term 'neuroscience' itself incorporates different disciplines and professions researching the relationship between brain and behaviour. For example, researchers with diverse backgrounds, such as psychiatry, neuropsychology, psychology and endocrinology – to name just a few, undertake research on the relationship between hormones and behaviour. The following chapter gives a very brief overview of relevant areas of research findings with a focus on child development and aggressive behaviour in juveniles. In order to place this dissertation within the relevant literature, this is followed by studies on the application of neuroscientific knowledge in practice. As there is a growing trend to adopt approaches such as 'best practice' and 'evidence-based practice', the concept of knowledge is explored in the next subsection. Looking at the broader implications of these trends towards a professionalisation of practice in the context of a transdisciplinarity in juvenile justice concludes this section.

2 Relevant neuroscientific findings on aggression and violence

In the field of neuroscience, an extensive number of publications and research projects on aggressive behaviour (and violence) now exist. Neuroscientific research on aggression covers several different areas including brain imaging, psychophysiology, hormones and neurotransmitters, brain plasticity, psychology and rehabilitation. The neuroscientific studies relevant to this project are oriented both towards broader concepts and theory developments, as well as research that can be translated into practice. Given the aim of this research project, research on a molecular or cellular level will not be reviewed. Additionally, only certain areas of neuroscientific research were referred to by the interviewees. As a consequence, the following subsection does not include research on, for example, emotional regulation; the detailed role of the prefrontal cortex in aggressive behaviour; or the role of mirror neurons.

2.1 Neurodevelopmental research

Over the past decades, a growing number of publications and research have focused on the impact of attachment between a child and its caregiver on the development of the brain and the development of a child from a neuroscientific perspective. The following paragraphs give a brief overview of the main points of the attachment theories that are relevant to practitioners in juvenile justice practice.

> Modern ideas about children's development, including the way experience shapes the young brain, recognise that all of these elements interact in a continuous and dynamic way. Development takes place in a bewildering series of transactions between the individual and his or her environments. So, for example, a secure attachment and a cheerful temperament are likely to

> equip a young child well to take advantage of the next development opportunity that comes their way. (Daniel and Wassell 2010: 9)

Attachment theories were 'originated by Bowlby (1969) and further developed by Ainsworth et al. (1978)' (Daniel and Wassell 2010: 21). Attachment styles can be differentiated into a secure and three insecure attachment forms; namely avoidant, anxious-ambivalent and insecure-disorganised (Gerring 2004). According to the theory, these attachment styles have an impact on all aspects of social life. It is accepted that aggressive and antisocial behaviour can be a consequence of insecure attachment styles in children and adolescents (Connor 2004).

Of specific interest here is the fact that the

> orbitofrontal system's location, in an area where the cortex (outer layers) and subcortex (underlying areas) meet, allows it to act as a crucial arbiter of cognitive-emotional interactions. It is therefore involved in attachment functions. (Sroufe et al. 1999: 2)

Here, particularly the right hemisphere is important as this part of the brain is involved in processes relevant for emotions, inhibitory control and non-verbal communication. Farmer states that children learn emotions and processes involved with emotions and affection through interaction with their main caregiver (Farmer 2009). Schore describes the interaction between the main caregivers and the child as a process of being 'psychobiologically attuned' (2001). This interaction depends on the main caregiver's ability to react to the child's cues appropriately and in time so that the child can develop skills to manage his or her affections and emotions, and is also vital for the 'neuronal growth of the developing brain' (Moses and Knutsen 2007). In order to develop secure attachments and a stable internal working model, which help to predict the environment and other people, children need predictability of care, the provision of a secure base as well as a coherent story (Daniel and Wassell 2010).

On the other hand, this theory also acknowledges the role the child plays in this *inter*action: Here, an example is psychopathology as:

> within attachment theory, psychopathology is viewed as a developmental construction, resulting from an ongoing transactive process as the evolving person successively interacts with the environment. Individuals transform the environment but are also transformed by it. (Sroufe at al. 1999: 1)

The concept of 'earned secures' (Siegel 2005) shows that change and positive developments are possible, even if the individual previously had an insecure attachment style. Here, children or adults who have developed a disorganised attachment style as a child, manage to develop a secure attachment style over time.

Additionally, findings on the relationship between early childhood experiences, attachment styles and emotional development, suggest, that neuroplasticity is mainly dominant during adolescence: 'It turns out that the teenage brain undergoes disorganisation and reorganisation from the onset of puberty into the early twenties' (Bechhofer and Paterson 2000: 44). The result is the development of faster and more efficient information processing systems like self-regulation, planning and foresight and emotional integration (Cozolino 2006). These times of restructuring often result in more 'risky behaviours and addiction coupled with poor judgement and lack of adequate impulse control' (Cozolino 2006: 44). This could explain the so-called 'age-crime curve', which is a cross-cultural empirical observation. This theory, developed by Farrington (1990), states that the *onset* of juvenile offending usually develops in late childhood and early adolescence. The *peak* of juvenile offending is usually at the age of middle to late adolescence. After late adolescence, many juveniles stop their offending behaviour. This is in contrast to the 'age-aggression curve', which shows a peak of aggression in childhood (usually around the age of two) and a subsequent decrease afterwards (Nagin and Trembley 2001). So far, there is no explanation from neurobiological research, which could explain these different slopes (Loeber and Hay 1997).

The other concept worth mentioning here is Moffitt's theory of Life-Course Persistent and Adolescence-Limited Antisocial Behaviour:

> According to the theory, life-course-persistent offenders' antisocial behaviour has its origins in neurodevelopmental processes, begins in childhood, and continues worsening thereafter. In contrast, adolescence-limited offenders' antisocial behaviour has its origins in social processes, begins in adolescence, and desists in young adulthood. According to the theory, life-course persistent antisocials are few, persistent, and pathological. Adolescence-limited antisocials are common, relatively transient and near normative. (Moffitt 2003: 49)

This taxonomy is now included in the DSM-IV-TR and the DSM-V by the American Psychiatric Association (2000, 1994, 2013). Two further types were added later, originally labelled 'recoveries' by Moffitt and her colleagues (1993) as cited in Caroll et al. (2009: 105), later labelled 'low-level chronics' and finally the 'abstainers'. Low-level chronics are continuously offending at a low rate either in the period from childhood to adolescence or from adolescence to adulthood. Abstainers are the group of people who never engage in any kind of antisocial behaviour (Carroll 2009). These additional categories complete the taxonomy. Moffit's trajectories have, nonetheless, received substantial criticism, particularly referring to the group 'adolescent limited'. McVie, for example, argues that this category in particular is 'a far more complex group than Moffitt contends and requires much more scrutiny' (2003: 13). However, Moffitt (2008) states that adolescent limited-offending behaviour is at one end of a continuum and life-course persistent offending behaviour at the other end, whereby the middle of this continuum is thought to be blurry.

This shows, that child development, as well as juvenile offending and juvenile aggressive behaviour, are complex and influenced by various different factors. Additionally, these complex behaviours cannot be explained universally and with only one model. The general statement by Cozolino summarises these relationships

as follows: 'Although antisocial behaviour is a complex phenomenon, correlations exists between antisocial types of behaviour and deficits in affect regulation, impulse control, and the ability to relate to the experiences of others' (2004: 271).

(Neuro-) Scientists suggest a strong interaction between biology, social, economic and environmental as well as individual factors.

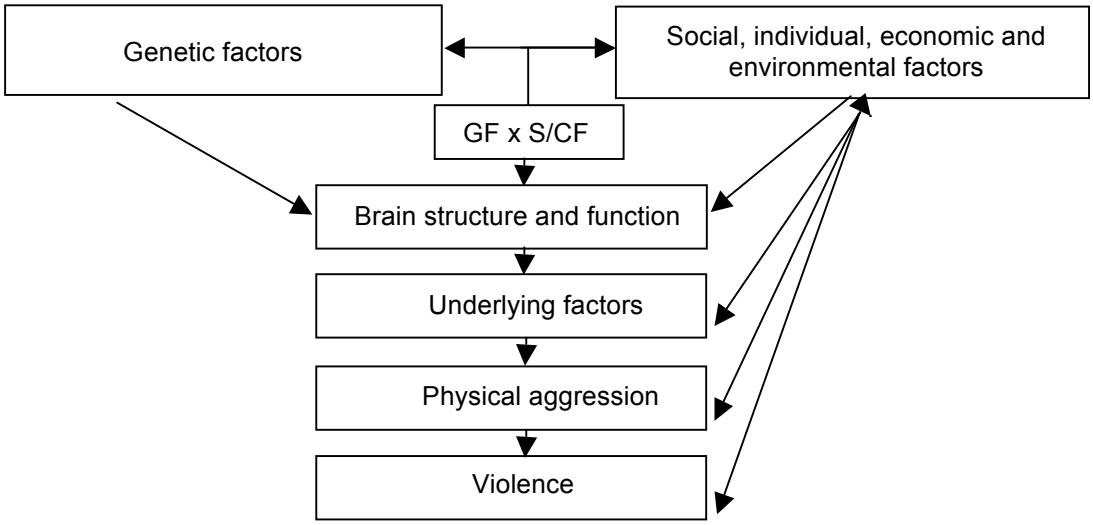

Image 1: Relationship between elements of neurobiological factors (GF) and social and contextual factors (S/CF) that influence the development of violence (Loeber and Pardini 2009: 2)

The model in Image 1 shows the relationship between the different factors that contribute to the development of violent behaviour and suggests a complex interplay between genetic, social, individual, economic and environmental factors as well as brain structure and function. The process of brain development is complex and continues throughout life, including a reorganisation, which takes place during adolescence (Rutter and Beckett 2007). As with most aspects of human development, this is viewed as 'an outcome of a bi-directional process in which both the genes and the environment interact' (Zigler et al. 2002: 28). For example, there seems to be a connection between abuse experiences in early childhood and

reactions to social environments later on in life: it is suggested, that as a consequence of the (physical) abuse experiences, the reading of social cues and social information-processing is impaired and can result in aggressive behaviour (Connor 2004).

Here, the term trauma requires specific attention. Terr, for example, describes psychological trauma in children as 'the mental result of one sudden, external blow or a series of blows rendering the young person temporarily helpless and breaking past ordinary coping and defensive operations' (Terr 1991: 11). According to Terr (1991), the continuum of 'trauma' includes single events such as a robbery or an earthquake (Trauma I), but also an accumulation of chronic adverse life situations such as emotional neglect and abuse (Trauma II). As the concepts of trauma or stress are not sharply delineated, the effects on the (brain) development of the children are summarised and equalised. Additionally, Ogawa states: 'multiple experiences of trauma affect a child's sense of control and, as a consequence, increase the child's vulnerability and hopelessness. Therefore, a child with a history of numerous traumas may develop more acute and severe symptoms compared with a child who does not have prior trauma experience' (2004: 19).

2.2 Studies and findings about the relationship between cortisol and stress responses/aggressive behaviour

Schore states that attachment theories and the impact of the received caregiving on the development of stress and coping systems of infants and children is now evidenced by studies on 'the influence of maternal factors on the ontogeny of the limbic-hypothalamic-pituitary-adrenal axis' (2001: 204). In this context, there is often reference made to stress responses. Important in this context is the fear-flight-fight response, as a reaction to stress: it is 'interwoven with the most highly evolved association areas of the cerebral cortex used to consciously analyze threat' (Cozolino

2006: 28). It is difficult, but possible, to interrupt this process on a conscious level, even whilst under extreme stress.

> When threatened, a human will engage specific adaptive mental and physical responses. Increasing threat alters mental state, style of thinking (cognition), and physiology (e.g. increase heart rate, muscle tone, rate of respiration). As the individual moves along the threat continuum from calm to arousal to alarm, fear, and terror—different areas of the brain control and orchestrate mental and physical functioning. The more threatened the individual, the more 'primitive' (or regressed) becomes the style of thinking and behaving. (Perry 1995: 274)

Teicher et al. (2012) argue that repeated early experience of violence and aggression in early childhood results in a change of the stress-response system, which has the potential to alter brain development. In the long-term, this then results in a damage of the neocortex and a diminished integration of the two parts of the brain with an enhanced reaction in the limbic system. This then might result in post-traumatic stress disorders (PTSD) and depression.

Cortisol, stress regulation and aggressive behaviour

> A hallmark of the stress response is the activation of the autonomic nervous system and hypothalamo-pituitary-adrenal (HPA) axis, and the 'fight-or-flight' response is the classical way of envisioning the behavioural and physiological response to a threat from a dangerous situation, be it a predator, a mugger, an accident, or natural disaster. The organism needs the normal stress hormone response to survive such situations, and inadequate or excessive adrenocortical and autonomic function is deleterious for health and survival. (McEwen 2007: 873)

The following image displays the relationship between the different forms of stress (environmental stressors, major life events and trauma and abuse), the behavioural as well as physiological responses of the individual and the role of the brain.

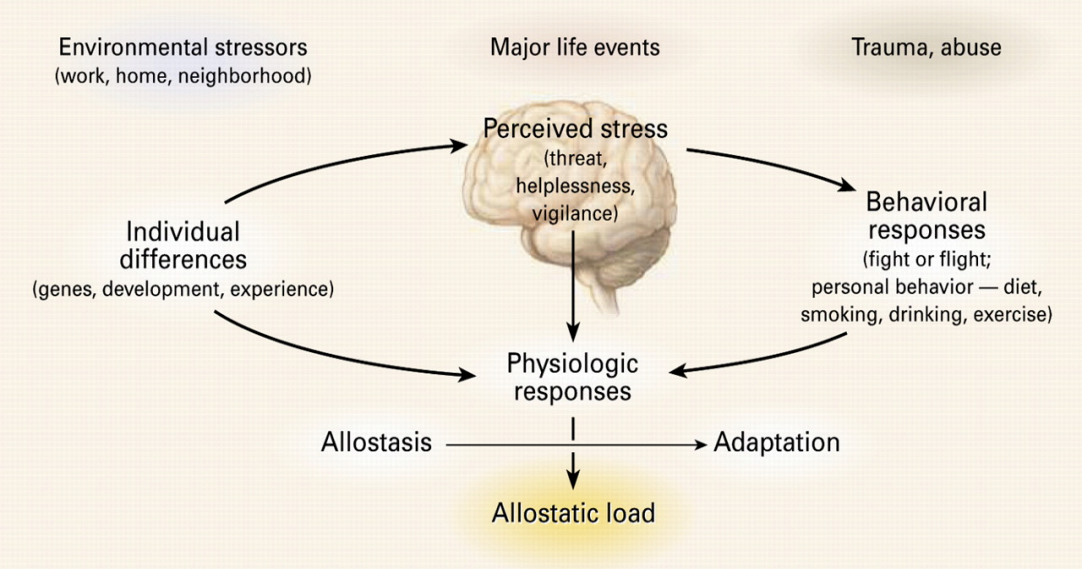

Image 2: The brain and reactions to stress (McEwen 2007: 8754)

In order for the body to function successfully, it always tries to achieve a return to a homeostatic balance. This homeostatic balance is accomplished by allostasis, which involves hormones and stress mediators. If the hormones or stress mediators are not regulated effectively – and consequently cause damage to the body – this is referred to as allostastic load (McEwen 2007). Neuroscientific studies about stress responses are usually based on the theory that cortisol (a hormone produced by the hypothalamic-pituitary-adrenal system) is involved in the stress regulation:

> this statement can be made, since numerous studies have provided evidence that hypothalamic nuclei not only control basic functions such as food and water intake, but are also essential for the organization of reproduction, body temperature regulation and hormone secretion by the pituitary. (Buijs and van Eden 2000: 118)

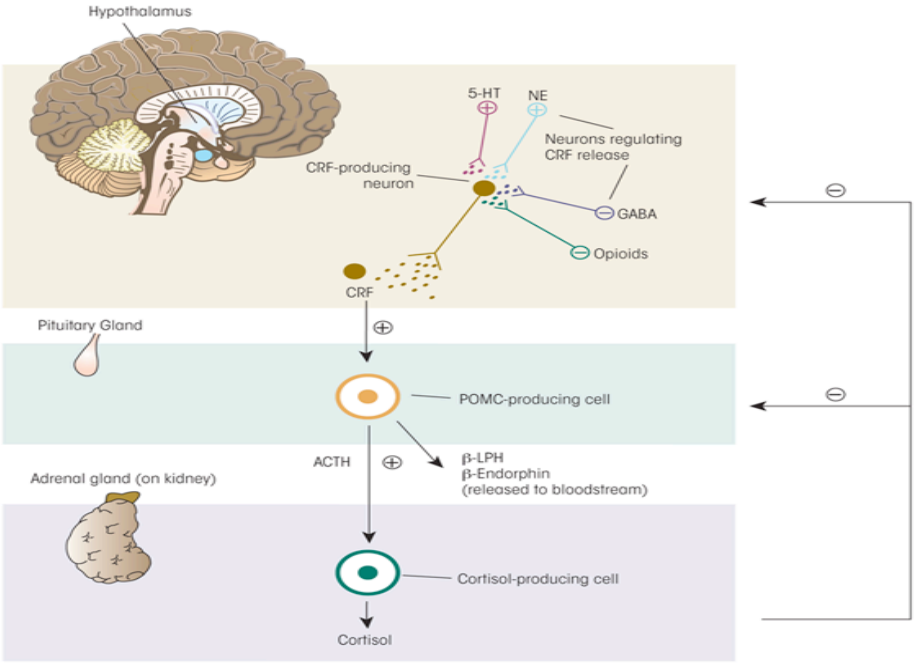

Image 3: The HPA axis with positive and negative feedback loops (Stephens and Wand 2012: 469)[4]

The above image refers to the so-called HPA axis, which is the combination of the hypothalamus, the pituitary and the adrenal glands connected through a feedback loop. When a stress response is triggered, the hypothalamus produces CRH and vasopressin (VP). This then binds to receptors in the pituitary and produces adrenocorticotropic (ACT) hormones. ACTH then binds to adrenal gland receptors on top of the kidneys and the secretion of cortisol is triggered.

> The end product, cortisol, has a wide range of physiological effects in the body; virtually all of the body's single nucleated cells are potential targets for cortisol. Cortisol plays a critical role in metabolism by mobilizing resources to provide energy. This helps to overcome the increased metabolic demand presented by a host of challenges. It also regulates or impacts on other important physiological systems, like the immune system, the sympathetic-adrenal-medullary (SAM) axis, the cardiovascular system, as well as affective and cognitive processes. (Kudielka and Kirschbaum 2005: 114)

[4] - stands for inhibition, + for excitment

Numerous studies are investigating the negative effect cortisol can have on the nervous system and the brain.

> Healthy adaptation (indeed survival) relies on an individual's ability to produce increased levels of cortisol under stress and to abate the production of cortisol once the stressor had minimized. (Klimes-Dougan and Hastings 2001: 696)

There also seems an effect of cortisol on the hippocampus, and therefore learning and memory (Bremner 1999). What has been established, for example, through studies on baboons or rats (Bear et al. 2001) is that high doses of cortisol, can, over a prolonged period, change neuro-pathways. 'Cortisol can, in high enough levels, destroy brain cells or reduce cell connections in the brain' (Gunnar and Donzella 2002: 216). The theory therefore is that high doses of cortisol (or altered levels of cortisol) have an impact on behaviour of juveniles in respect of their behavioural response to stress:

> Next, these elevated levels enhance the functioning of the amygdala, which is a brain region that orchestrates the fear response, helps us understand the emotional significance of stimuli, and enhances memories of emotionally significant events. However, the increased cortisol can impair the hippocampus, even leading to neuron death. In addition, the high levels of norepinephrine and dopamine impair the functioning of the prefrontal cortex, a higher brain region involved in complex thought that also regulates emotion through its connections with the amygdala. Recent animal research shows that one function of the prefrontal cortex may be to block repeated fear responses to the same stimulus, thus impairment in this region might explain why people with PTSD experience their fear over and over again. (The Society of Neuroscience)[5]

Studies show a possibility that the hippocampus is able to 'regenerate neurons' (Bremner 1999). It might therefore be possible to reverse these damages, for example, through Cognitive Behaviour Therapy (CBT).

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[5] http://www.sfn.org

Buijs and Van Eden (2000) argue that stress can be differentiated in 'homeostatic' and 'emotional' stress: emotional stress relates to circumstances where a possible threat is perceived which possibly results in a change of homeostatic balance (LeDoux 1998). There is, however, a difference in how these different stressors are processed in the brain:

> Stressors involving an immediate physiologic threat ('systemic ' stressors) are relayed directly to the PVN [neuroendocrine paraventricular nucleus in the hypothalamus], probably via brainstem catecholaminergic projections. By contrast, stressors requiring interpretation by higher brain structures ('processive' stressors) appear to be channeled through limbic forebrain circuits. (Herman and Cullinan 1997: 80)

There are a number of studies on the relationship between cortisol and aggression in juveniles. The underlying assumption of these studies is that the relationship between aggression and cortisol levels will provide a deeper understanding. There is further agreement that stress-regulation mechanisms seem to play a role in aggressive behaviour as aggression can be viewed as a stress-response. Consequently, it is assumed that the activity of cortisol plays a role in aggressive behaviour. These studies are based on the theory that cortisol (a hormone produced by the hypothalamic-pituitary-adrenal system) is involved in the stress regulation of the body and:

> stress plays an important role in explaining individual differences in antisocial behaviour … under conditions of sensitive and responsive care giving, the high cortisol responsivity of the newborn diminishes and it becomes difficult to provoke increases in cortisol to many stressors by the end of the first year of life. (Gunnar and Donzella 2002: 215)

This has an influence on attachment behaviours as results from several studies suggest that the cortisol levels are different and react in another way when comparing well-cared for children with neglected or abused children. Although various studies suggest a link between stress behaviours, attachment styles and/or

aggressive behavior (McBurnett et al. 1996; van Goozen and Mathys 1998), other studies do not suggest a correlation (McBurnett and Lahey 1991). As above, the results are not consistent. However,

> taken together, these longitudinal studies support theories about a relationship between cortisol hyposecretion and the HPA-axis under arousal on the one hand, and aggression and related behaviours on the other, in youth (Connor 2004: 199).

Another important system in the development of aggressive behavior, stress and trauma is the self-soothing system (serotonin 5HT-System). Cools et al. (2007) argue that the 5HT system also plays a role in the way children and young people learn to cope with stress and trauma:

> The review suggests that dysfunctional interactions between serotonin and dopamine systems in the prefrontal cortex may be an important mechanism underlying the link between impulsive aggression and its comorbid disorders. (Seo et al. 2008: 383)

These research results therefore suggest that children, who have not learned to develop strategies to calm themselves down, are more likely to develop aggressive behaviour than other children.

Resting heart rate and aggressive behaviour

Studies on neurophysiology include research on levels of arousal, cognition, learning and emotions. Prominent and widely cited are studies on the resting heart rate levels and heart rate reactivity. There seems to be a correlation between the resting heart rate and violence and aggression, as well as heart rate and the vicious cycle of aggressive outbursts (Niehoff 1999). Raine (1997) and van Goozen and Matthys (1998) undertook studies on the correlation between aggressive behaviour in juveniles and their resting heart rate. The results suggest that aggressive juveniles

have lower resting heart rates than non-aggressive control groups, or lower heart rates in those who were criminal at a later time in their lives. These studies need to be examined carefully as they differ in their set-up, criteria for participation, age group, and also in their definition of aggressive behaviour, which then consequently might produce different results. However, the findings of low resting heart rates are robust among children exhibiting aggression (Scarpa and Raine 2007). Although the results are not consistent when investigating the autonomic reactivity to stressful stimuli, in light of all the studies, it can be concluded, that,

> these findings are consistent with the idea that aggression in children entails difficulties regulating anger and other emotional reactions – with consequent enhancement of defensive reactivity under condition of threat (Patrick 2008: 2545).

A basic suggestion for using this knowledge about neurophysiology and aggression and violence is made by Siegel (2005), who states that it is important to learn sensing biological changes of higher blood pressure and muscle tension as a pre-state of an outburst of aggression or violence. Novaco's model of anger management (Novaco 1975, 2003) – a widespread method in juvenile justice – uses these ideas in combination with cognitive behavioural methods.

2.3 Neurotoxins

Further neurodevelopmental research includes the effects of neurotoxins (for example, prenatal alcohol, and nicotine and drug exposure): 'the course of development is associated with many adverse neurocognitive, neurobehavioural and structural anatomical abnormalities' (Connor 2004: 126). Particularly studies on foetal alcohol exposure suggest that

> evidence suggests that the neocortex, hippocampus, cerebellum, and hypothalamic-pituitary-adrenal axis, as well as developmental patterns of

> various neurotransmitters, may all be disrupted by foetal exposure to alcohol. (Guerri 1998: 312)

It has to be said, however, that the influence of neurotoxins on the development depends strongly on the dose, the time of exposure and other environmental and individual risk factors (Connor 2004). It seems that the stronger the dose and the earlier the exposure during pregnancy, the more severe the effects on development, learning, cognition and emotional functioning. The most severe syndrome is called 'foetal alcohol syndrome' (FAS):

> The available data suggest that although many children exposed to high amounts of alcohol prenatally are spared physical and anatomical consequences, they remain at risk for cognitive and behavioural problems (Roebuck et al. 1998: 344)

This might even result in elevated rates of psychopathology. The effect of nicotine on the foetus mainly affects neurotransmitters and synapses – with long-term effects on the cognitive and behavioural development of the child (Connor 2004).

2.4 Brain imaging studies

Research in the field of brain imaging includes research with computer tomography (CT), magnetic resonance imaging (MRI), single-photon emission tomography (SPECT), positron emission computed tomography (PET), magnet-encephalography (MEG), magnetic resonance spectroscopy (MRS), functional MRI (fMRI) and regional cerebral blood flow (rCBF). These non-invasive tools enable researching the different structures, physiology and the development of the brain (Connor 2004). However, this research is still developing and no results are available that would allow a generalised statement for practitioners so far. Other functional magnetic resonance imaging (fMRI) studies suggest that the increase in aggression and violence during teenage years is consistent with an:

> exaggerated nucleus accumbens (NAcc) activity relative to activity in regions of the prefrontal cortex (PFC), compared with children and adults, and this development normalises by the age of 20 years. This is a significant result, as the NAcc, a specific part of the limbic system, is involved in pleasure responses, reward-seeking behaviours and addiction. The PFC is involved in impulse control and therefore, teenagers are more focused on short-term goals rather than long-term consequences of their behaviour. (Cozolino 2006: 271)

These studies additionally show an increase in responsiveness to angry and fearful faces (Cozolino 2006).

2.5 Gender studies

Statistics from The Edinburgh Youth and Transition Study, for example, on levels of antisocial and aggressive behavior, suggest that there are a higher number of male juvenile violent offenders compared with female violent offenders. Additionally, the peak times of aggressive behaviours during the development differ between these two groups (McVie 2003). This study also suggests that for males the (regular) consumption of alcohol influences violent behaviour and this result is significantly higher than for females (McVie 2003). Additionally, male juvenile offending is usually more serious and therefore more in the focus of attentions (Moffitt 2001). Moffitt explains these differences by 'compromised neuro-cognitive status and more hyperactivity in young males as well as more peer problems' (1987: 7). Here, a hypothesis is made that gonadal hormones play a role: the level of sex hormones babies are exposed to pre-birth differentiates between the genders (Connor 2004). Also, males tend to externalise their behaviour more than girls. The fact that the level of difference becomes pronounced during adolescence might be due to a difference in brain organisation during this period (Connor 2004).

3 Neuroscientific findings and their application in practice

Over the last few years, more and more studies have been published which examine the relationship between neuroscientific findings, aggressive behaviour, clinical practice and the law. There is an ongoing debate regarding whether brain scans can be used as evidence in court (Eagleman 2008; Yang and Glenn 2008). The New York Times (Rosen 2007) even goes as far as to say: 'When historians of the future try to identify the moment that neuroscience began to transform the American legal system, they may point to a little-noticed case from the early 1990s'. This article refers to a specific case, where a brain scan was used as evidence in court for the first time.

Weisberg and Keil (2008) found in their study that: 'The neuroscience information had a particularly striking effect on non-experts' judgment of bad explanations, masking otherwise salient problems in these explanations' (2008: 470). They call this phenomenon a 'seductive allure'. They see a problem in this, as:

> Given the results reported here, such evidence presented in a courtroom, a classroom, or a political debate, regardless of the scientific status or relevance of this evidence, could strongly sway opinion, beyond what the evidence can support. (2008: 477)

These findings were, for example, supported by a recent study by Aspinwall and Brown (2012). This study investigates how neuroscientific knowledge influences the way judges rule on acts of crime committed by psychopaths in the USA. Here, a trend towards a more stringent sentencing is detected if judges have been introduced to functional magnetic resonance imaging (fMRI) lie detection evidence:

> Results showed that fMRI lie detection evidence led to more guilty verdicts than lie detection evidence based on polygraph evidence, thermal facial

> imaging, or a control condition that did not include lie detection evidence. However, when the validity of the fMRI lie detection evidence was called into question on cross-examination, guilty verdicts were reduced to the level of the control condition. (Aspinwall and Brown 2010: 846)

Aspinwall and Brown (2012) argue that the debate on neuroscientific evidence and court ruling also involves thinking about free will and responsibilities as well as interpreting scientific evidence. He further summarises, that although defence lawyers in American courts sometimes use neuroscientific research findings, the research results only rarely enable courts to draw conclusions on individual cases. In the context of brain injuries, Eagleman states: 'Having special court systems, mental health courts and recognising the importance of mental health issues is where we need to go' (2008: 38).

Pickersgill (2011) investigates the 'therapeutic promise' of neuroscience in the context of personality disorders by interviewing psychiatrists, psychologists and neuroscientists. Pickersgill suggests, that: 'While the findings of neuroscience research may well be interacting with existing professional understandings of personality disorders, this does not appear to be translating into substantive shifts in the organization of work at the clinical coalface' (2011: 461). He additionally found an 'ambivalence' in clinicians and scientists towards neuroscience, due to a hope for an enhancement of practice on one side but doubts on the other side, that 'personality disorders might not be ameliorable through clinical interventions at all' (2011: 460).

Bruer (1999, 2001, 2012) deconstructs the influence of neuroscientific research findings on policy debates in the field of early intervention as a 'myth ' and argues, that the facilitated findings are often outdated, stem from the same authors most of the time and are oversimplified and overgeneralised. Wastell and White state that in policy debates on early intervention 'Neuroscientific evidence is prominent in this

discourse, creating the lustre of science, but too much has been taken on trust.' (2012: 397). These policy debates influence juvenile justice practice as well as social work practice in children and families settings in the UK.

Although this is just an excerpt of studies and literature in this field, it can be concluded that there is a significant interest in investigating the relationship between neuroscientific findings on aggressive and/or criminal behaviour and professional practice of law, psychology and psychiatry. It is therefore of interest to investigate the relevance of neuroscientific research for social work practice with people in contact with the criminal or juvenile justice system. The following subsection describes the relevance (research-based) knowledge has on the day-to-day work of practitioners in Scotland.

4 Knowledge for practitioners

McNeill et al. (2005) found in a literature review that practitioners in criminal and juvenile justice practice require a set of different skills to reduce reoffending behaviour:

- Building relationships that support change;
- Assessing risks, needs and strengths;
- Research-based planning and delivery of interventions;
- Managing change.

Here, particularly the points made in respect of assessment of risks, needs and strengths, as well as research-based planning and delivery of interventions,

highlight how important research and knowledge is viewed for being a successful practitioner. For this PhD, the emphasis is placed on the way neuroscientific knowledge changes from research publications to the way it is utilised by practitioners in practice. The questions that arise here are how the described neuroscientific knowledge is changed to a knowledge that can be used by non-neuroscientists; how this knowledge is incorporated in methods; and the day-to-day practice with the constraints, limitations and influences described above. Additionally, it is of interest to investigate how neuroscientific knowledge is constructed amongst practitioners in this context. The area of aggression and violence was chosen, as this is a highly relevant topic for juvenile justice practitioners and covers a broad area of interventions in the day-to-day work of practitioners.

In juvenile justice, knowledge for a practitioner is based on several different theories:

Theories of juvenile offending

There are different theories that inform policy and practice in juvenile justice as they all try to explain criminal behaviour. The most important are summarised by Whyte (2009) as follows:

- Biological theories about criminal behaviour, which include genetics, evolutionary psychology, neurobiology, twin-studies and adoption studies. These theories try to explain criminal behaviour from a biological point of view by investigating the links between personality, behaviour and biology.
- Socio-economic and ecological theories – which include theories about control, disorganisation, reaction and strain. These theories look at the

impact of society, community, social control and (deprived) social circumstances on youth crime.

- Psychodynamic, rational choice and social learning theories focus on the individual and link either elements of child development, cognitive behaviour, personal choice and peer groups to offending behaviour.

These theories all focus on particular aspects of criminal behaviour; they are not exclusively applicable to describe, assess and possibly resolve the complex issue of youth crime (Schmitt 2008). The modern trend has been towards multi-factorial models, which include several of the above named theories and allow a multi-agency approach to reduce offending and prevent re-offending behaviour (Whyte 2009).

> Clearly, if these individualised interventions to support desistance need to be multi-dimensional, then so too are the skills required to deliver them. Crucially, the business of reducing reoffending by *supporting change* involves a range of skills that goes far beyond those involved in reducing reoffending by imposing control, monitoring or enforcement, important though these measures are. What is required is a complex mix of skills which require significant personal qualities as well as a high degree of training across a range of therapeutic, academic and management disciplines in order that one worker is able to draw together approaches that address various areas of an offender's life so as to coherently and consistently support the change process. (McNeill et al. 2005: 40)

Knowledge, however, is a commonly used concept, which can have various meanings depending on the context. In juvenile justice knowledge can be differentiated as follows: knowledge used in the process of deciding on legislation and laws; by policymakers in the policymaking process; and knowledge used by practitioners in their day-to-day work with aggressive or violent juveniles. For this project, practitioners' knowledge is particularly interesting: 'Practitioners' knowledge is acquired directly through the practice of social caring and the distillation of collective wisdom at many points through media such as education

and training, requesting and receiving advice, attending of team meetings and case conferences, and comparing notes' (Pawson and Boaz 2003: 49). For this investigation, knowledge influencing the methods and tools used in practice is important as well. As a consequence, for policymaking and practitioners, research from different areas informs their practice in this field. Weiss's typology of research utilisation (Weiss 1979) for policymaking still gives a valuable concept:

- Problem solving (research is used by policymakers to solve a specific problem);
- Knowledge-driven (research is based on policy-making relevance);
- Interactive (researchers and policymakers interact with each other);
- Political (research is used to achieve a specific political goal);
- Tactical (the importance here is the research process as part of a political tactic, not the research findings);
- Enlightenment (research findings influence policymaking gradually and over a long period of time in an unstructured and messy way).

On the level of senior management and government tactical, political, interactive and knowledge-driven research and utilisation should be very relevant. However, on a practitioner's level, this knowledge might not play an important role. It is therefore expected that the focus is on enlightenment for the level of practitioners. Of particular interest is the knowledge gained and the research used during (pre- and post-qualifying) training of juvenile justice professionals. The above-named differentiations are only general classifications and are not detailed enough for this project. Pawson and Boaz (2003) establish that knowledge in social care can be classified into the sources and the purpose of knowledge. Their differentiations of the different sources of knowledge are as follows:

- Organisational knowledge (gained from management and governance of social care);
- Practitioner knowledge (gained from the conduct of social care);
- User knowledge (gained from wider policy environment);
- Research knowledge (gathered systematically with predetermined design);

- Policy community knowledge (gained from experience of service use and subsequent reflection).

(Pawson and Boaz 2003)

The argument is that all of the named categories are relevant when investigating evidence bases of practitioners' knowledge: 'all these sources have a vital role to play in building up the social care evidence base, there being no hierarchy implied in the above list' (Pawson and Boaz 2003: viii). The additional layer of classification, the purpose of knowledge (for example, proactive assessment and trouble shooting, programme and organisational improvement, oversight, monitoring and compliance), is not relevant for this project as it does not involve scientific knowledge that informs practice and policies, and is therefore not discussed here.

Although the above concepts are useful, they do not capture the relationship between the different types of professional knowledge. Here, Jensen (1993, cited in Payne and Askeland 2008) established three aspects of professional knowledge: life-historical, traditional professional and scientific knowledge. Payne and Askeland state 'that these three types of knowledge are constructed in different arenas of social work discourse' (2008: 17). The important type of knowledge for this project is scientific knowledge and includes all knowledge that is produced through research. The other forms of knowledge are established through personal experience and professional environment, guidelines and experience. Jensen describes the relationship between the different forms of knowledge as an exchange through testing, refining, adjusting and interpreting (Jenson 1993, cited in Payne and Askeland 2008). Trevithick (2008) establishes three aspects of professional knowledge in her framework for knowledge in social work: theoretical, factual (including research) and practice/practical/ personal knowledge. These three aspects interact, complement and compete with each other. The types investigated during this project are factual and theoretical knowledge and include knowledge that is produced through research. Theoretical knowledge relevant for juvenile justice

practice serves different purposes, however, one important aspect of knowledge and theory for practitioners can, according to Trevithick's framework, be defined as '(i) theories that illuminate our understanding of people, situations and events, (ii) theories that analyse the role, task and purpose of social work, and (iii) theories that relate to direct practice, such as practice approaches and perspectives' (Trevithick 2008: 1218). The other forms are built through personal experience and the professional environment, guidelines and experience. Both models have guided the analysis of the data.

5 'Evidence-based practice' and knowledge utilisation in practice

Knowledge transfer has become more and more important over the past decades. As a consequence of this development, the policymaking process has been more influenced by knowledge (Hudson and Lowe 2004) and the trend to evidence-based policy and practice in social services has increased (Nutley and Walter 2007). Straus et al. state: 'The evidence-based practice approach requires the integration of the best research evidence available with the practitioner's clinical expertise and the patient's unique values and circumstances' (2005: 1).

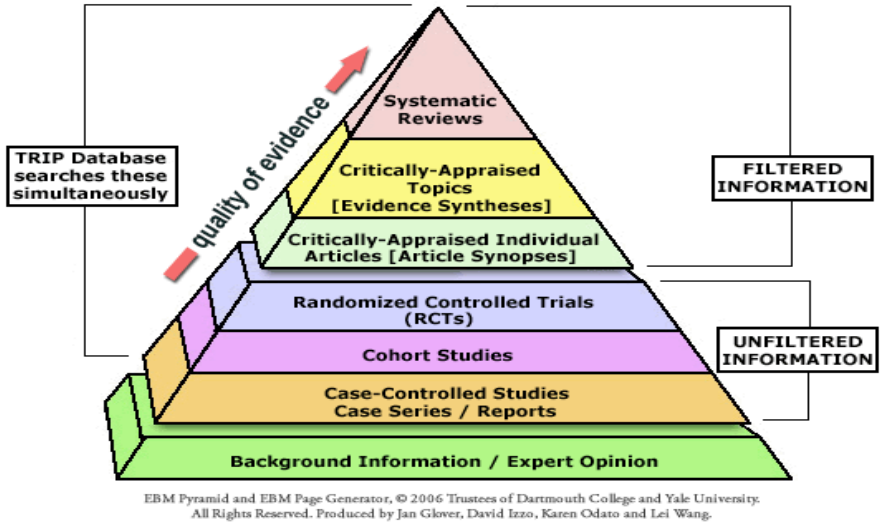

Image 4: Evidence Hierarchy Pyramid Model (EMD 2006)

The model above displays different levels of evidence in terms of their reliability as they are used in the medical professions. There is a difference, however, between how evidence-based practice (EBP) is applied in the medical field and how it can be applied in social work practice. This raises the question of how evidence is defined. This model portrays a narrow definition of evidence: best available evidence is a result of experimental or randomised control trials. However, as Gray et al. summarise, this does not fit well with social work practice:

> Those who oppose the strict, narrow, scientific view of evidence argue that there are many sources and forms of evidence relating to realistic, non-scientific factors, such as practitioner experience, expertise and judgment; available resources and the way in which they are distributed; and prevailing values, ideologies, habits and traditions. (2009: 5)

This is also supported by Nutley and Walter who state: 'There only appear to be relatively isolated groups of practitioners who regularly seek out research and use it in their day-to-day work' (2007: 209). This is due to various issues and problems. However, one important point here is that practitioners often do not have time to look for research and keep up with the latest studies. White argues, that particularly

in the context of children and families statutory services, '…the imperative is to decide what is wrong, not what works' (2011: 183). This means, that social workers need to make decisions based on quick decision-making, professional insight, organisational restraints and assessment instruments as well as research evidence.

There is also a question of whether this should be the responsibility of the individual worker (Nutley and Walter 2007). Therefore, Gray et al. define evidence-based social work as: 'entailing the mobilization of a specialist research infrastructure that can guide particular interventions, support best practice governance and demonstrate positive outcomes from service users' (2009: 1). They argue that evidence-based practice (EBP) goes beyond using and implementing research into the day-to-day work; it also includes guidelines, knowledge reviews, and networks, so that evidence can be accessed and applied.

Additionally, there is also the goal of transparency with this approach: EBP is supposed to inform the client, the public and all involved stakeholders about the interventions, methods, and so forth and their scientifically proven robustness (Gibbs and Gambrill 1999; Gambrill 2006). The Scottish Government describes the expectations to professionals in public services as follows:

> Exercising professional autonomy within a framework of accountability means that social workers must be able to explain and account for their practice, basing their decisions and planning their actions on the basis of sound assessment and robust evidence of what works. (Social Work Review 2006: Chapter 6)

Here, the recommendation also includes that front line practitioners need to be aware of up-to-date research and use evidence for their day-to-day practice. Professionals working in the field of juvenile justice (for example, social workers) in Scotland have been trained in evidence-based practice and have to provide a portfolio to provide evidence of their abilities to work to these standards in order to

be recognised by the Scottish Social Service Councils (SSSC) as qualified to undertake this kind of work[6]. Practitioners registered with the Scottish Social Service Council have to undertake a certain amount of training days per registration period to maintain their registration status. The continuing professional development (CDP), embedded in the Continuous Learning Framework (CLF), is an example of how these expectations are entrenched in the framework for practice (SSSC).

Although professionalisation and transparency of the work of public services should be welcome, there are also problematic developments within these efforts of implementing evidence-based practice. Here, particularly the 'what works programmes' in juvenile justice require some attention. For example, McAra argues, that

> Although 'What works programmes' are aimed at behavioural change (and thus can be regarded as rehabilitative in orientation), by making offending rather than the offender the focus of intervention, they have the potential to undermine the holistic and child-centered approach traditionally adopted by social workers. (2006: 134)

It is therefore important, to be conscious of the way, these changes affect practice and how knowledge impacts on the day-to-day work of practitioners. Flyvbjerg (2001) summarises that currently, the social sciences, and arguably the field of applied social science, are the 'losers ' in the 'Science War', which means:

> First, we must drop the fruitless effort to emulate natural science's success in producing cumulative and predictive theory, this approach simply does not work in social science. Second, we must take up problems that matter to the local, national and global communities in which we live. … Finally, we must effectively communicate the results of our research to our fellow citizens. If we do this, we may successfully transform social science from what is becoming a sterile academic activity … done in public for the public, sometimes to

[6] http://www.sssc.uk.com

> intervene, sometimes to generate new perspectives, and always to serve as eyes and ears in our ongoing efforts at understanding … (Flyvbjerg 2001: 116)

Another critical statement on the influence of the positivist approach to practice within the evidence-based agenda is stated by Clark (2011), who summarises Glasby and Beresford's (2006) conclusion in respect of the concept of evidence-based practice as follows: the important factor of successful practice is the so called *practice* or *professional wisdom* as well as the experience of the users, which are not considered in this approach.

> Professional wisdom, however, recognises and teaches that evidence-based practice will never cover all of the issues that the individual practitioner or the service organisations encounter in an average day… Furthermore professional wisdom gives full scope to the ineluctably individual character of professional expertise. (Clark 2011: 58)

And furthermore, Gray et al. argue, that in order to successfully transfer knowledge to practice it is important, that '… researchers, policymakers and practitioners accept different understandings of 'evidence' than are currently widely espoused by those whishing to standardize evidence-based social work' (2009: 162). To summarise, for the reasons discussed, a normative understanding of evidence-based practice does not capture the complex field of knowledge-for-practice in its full extend and needs to be considered within its limitations (Gray et al. 2009). It cannot provide all the answers practitioners need for their practice, including the problem of uncertainty and ambiguities that casework entails for the individual worker.

Following these considerations the complex knowledge utilisation process that influences knowledge-for-practice and practice wisdom is described over the next few paragraphs.

There are various different models and concepts to explain knowledge utilisation and translation: some focus on the interaction between the researcher and the user

of research (Jacobson et al. 2003), others focus on the learning of organisations or learning of the individual (Nutley and Walter 2007). Further, there seems to be a distinction between knowledge transfer or utilisation models in the policymaking process and models regarding practice. For the purpose of this study I only highlight the 'Coordinated Implementation Model' (Lomas 1993) in more detail. This model is of particular interest, as its focus is at the level of practitioners. It includes the influence of various different factors in the research implementation process; for example, the media, personal interests, attitudes and personal knowledge, as well as administrative and economic environments. It also takes account of the synthesis, distillation and appraisal of research information before it reaches the practitioner:

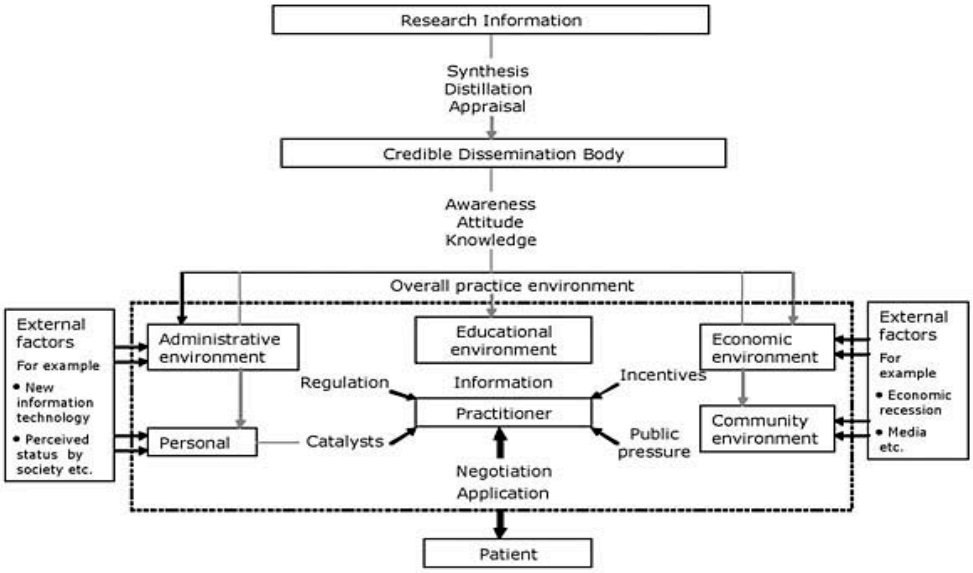

Image 5: Coordinated-Implementation-Model (Lomas 1993: 470)

This model provides valuable factors (for example: Where does the knowledge come from? How are attitudes shaping research uptake?) for the analysis of the data. However, the focus of this model is not on the knowledge or research information and can therefore only be used to inform this study rather than be used as basis for analysis. As established above, the knowledge base of juvenile justice

practitioners is very broad and, therefore, in order to investigate the process of knowledge translation, a concentration on a specific area is necessary. As our knowledge about the distinct factual and theoretical knowledge of social work practitioners is still unsatisfactory (Trevithick 2008), this PhD project focuses on one area of factual and theoretical knowledge, namely neuroscientific knowledge.

> Although many areas of professional knowledge are dependent on some understanding of relevant public codified knowledge found in books and journals, professional knowledge is constructed through experience and its nature depends on the cumulative acquisition, selection and interpretation of that experience. (Eraut 1994: 19-20)

Knowledge relevant for practice may be derived from science, but does not necessarily mean that facts are learned by heart and studied in the same sense students study for their exams: 'Social workers therefore need to have a broad knowledge base, rather than an in-depth one' (Askeland and Payne 2001: 14). D'Cruz differentiates here knowledge-for-practice and knowledge-in-practice:

> The former concept recognizes that the knowledge of social workers, as professionals, must enable them to perform their professional roles appropriately and effectively. The latter concept recognizes that there is a continuing preoccupation for all professions as to how abstract and general knowledge is made meaningful in the lives of actual people who seek help. (D'Cruz 2009: 70)

Here, this would mean that abstract concepts from neuroscientific research are translated or transformed into a knowledge, which can readily be applied by practitioners. Askeland and Payne interpret the work of Jensen (1993) as follows:

> Jensen proposes that scientific knowledge may be a prism through which a worker might interpret, organise and consequently validate the knowledge gained through life-historical and professional knowledge and transform scientific knowledge into practice. (Askeland and Payne 2001: 18)

This interaction between professional and scientific knowledge, through refinement, testing, expression and organisation (Askeland and Payne 2001) is then 'knowledge-for-practice' (D'Cruz 2009).

Farmer (2009) states that neuroscientific knowledge can be useful for social work practice, but suggest a 'transactional model' to integrate the different areas of knowledge:

> The transactional model (Farmer 1999) can provide a conceptual map for understanding and for applying human behaviour knowledge, including neuroscientific data, for the benefit for our clients. The model provides an approach for understanding the dynamic interrelationships between the biological, the psychological, the social, the spiritual, and the challenge in living. (Farmer 2009: 44)

Farmer describes the developed model as having 'simultaneous, interactive interrelationships' between them, so that a reductionist perspective on the influence of the singular components is ruled out and the practitioner can search for understanding of individual situations of clients by referring to the different components in an interactive way (2009: 47–49). Farmer also emphasises, that this holistic approach avoids an over- or underenthusiasm for neuroscientific knowledge.

In the context of a professionalisation of social work practice within the agenda of evidence-based practice, The Institute for Research and Innovation in Social Services (IRISS)[7] was established:

> IRISS mission: To promote positive outcomes for the people who use Scotland's social services by enhancing the capacity and capability of the social services workforce to access and make use of knowledge and research for service innovation and improvement. For practitioners, we:

[7] http://www.iriss.org.uk

- Support the workforce to develop their skills, learning and development;
- Provide resources that will help practitioners save time and improve efficiency;
- Support and advise the workforce on how to work in new ways.

IRISS has launched a web portal with tools and links to support policymakers as well as practitioners in the field of social services in the process of incorporating evidence and research into policymaking and practice.[8]

The Scottish Government and the ESRC have funded various studies, which investigated violence and youth violence (for example, 'Girls and Violence'[9] and 'The Edinburgh Study of Youth Transition and Crime'[10]). Additionally, The Scottish Government regularly audits juvenile justice policies to evaluate current practice (for example, Audit Scotland 2001). There is specific reference made to 'what works approaches' (2001: 4).

Also, various studies were funded to investigate the relationship between academic research and policymaking (for example, British Academy 2008). The summary includes recommendations on how this relationship can improve so that more research is used and more research is undertaken that is useful for policymaking and practice. These results support Nutley et al. and her statement that direct research use in policymaking is fairly limited and most policymaking is governed by politics. Nutley et al. argue that:

> Research and other forms of knowledge are often used in more subtle, indirect and conceptual ways: bringing about changes in knowledge and understanding, or shifts in perceptions, attitudes and beliefs, perhaps altering the ways in which policy-makers and practitioners think about what they do, how they do it, and why. (2007: 189)

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8 http://www.iriss.org.uk

9 http://www.gla.ac.uk/girlsandviolence

The increase of interest in knowledge transfer and translation can also be seen in the example of the ESRC and the Scottish Government having established a Knowledge Transfer Team within the Scottish Government and the ESRC to improve and increase knowledge transfer. In the UK, the Local Authority Research Initiative (LARCI) was established in 2002 to 'bring local authorities and Research Councils into closer partnership, leading to better informed research, policy and practice, and facilitating knowledge exchange at a strategic and operational level' (LARCI 2002).

Additionally, research has been commissioned on research transfer on topics like 'What works for Children?' (ESRC funded Evidence Network, Barnardos, the University of York and City University (Joughin 2006). There is an extensive amount of studies on the effectiveness of treatment in juvenile justice (see McGuire 1995), studies on 'what works in practice' (Nutley and Smith 2000) or on knowledge utilisation in evidence-based agendas in general (Nutley and Walter 2007).

However, particularly in social work research and in social work practice, the most important question remains, how knowledge from the different disciplines and fields of expertise and practice can be integrated, so that practitioners increase their professionalism and enhance their practice.

6 Professionalisation, transdisciplinarity and social work

There is a long-standing history of discussion on the importance of scientific knowledge from various different disciplines for social work practice (and research) and what this means for the profession. Staub-Bernasconi (2002), for example, describes a competence of transformation as relevant for social work professionals,

[10] http://www.law.ed.ac.uk/cls/esytc

as they need to be able to independently draw on scientific theories for guidance of their practice. Here, the question arises, are the concepts of multi- or interdisciplinary social work sufficient for this dilemma? Is it enough, that practitioners are able to cite certain theories or does it need more (Büchner 2012)? And what would this 'more' mean? Here, the terminology of transdisciplinarity in social work practice is a point of discussion. Gibbons (1994) describes transdisciplinarity as a new form of knowledge generation based on the investigation of the relationship between science and society. Gibbons differentiates between two modes of knowledge production: Mode 1, which is the academic or traditional production of knowledge, Mode 2, on the other hand, is:

> generated in a context of application. Of course, Mode 1 knowledge can also result in practical applications, but these are always separated from the actual knowledge production in space and time. This gap requires a so-called knowledge transfer. In Mode 2 such a distinction does not exist. (Hessel and van Lente 2008: 741)

Due to practical applications relevant for Mode 2 knowledge production and the involvement of various different stakeholders in the discussion and negation of knowledge, Kunnemann stated:

> I venture to suggest that knowledge-production in the domain of social work exhibits all the characteristics of mode two. This implies that it cannot be meaningfully interpreted with the help of an image of science completely based on traditional, academically dominated 'mode one' knowledge-production, unless such an interpretation serves to ward off the influence of other potential stakeholders and devalue their claims to valid and valuable insights. (2005: 196)

This is also relevant for the context of juvenile justice practice, in which various different theories and approaches are integrated by the practitioners and applied accordingly, as practitioners continuously change and shape (scientific) knowledge

in their day-to-day work. Büchner summarises the concept of transdisciplinarity as follows:

> Transdisciplinarity presents, in the widest sense, a principle of work, with which the disciplinary science is concentrating on the treatment of complex problems of the challenges of living. On the definition of 'challenges', that means the object of scientific endeavors, are on purpose not exclusively actors of the scientific community. Transdisciplinarity overcomes, more than interdisciplinarity, the boundaries of disciplines. This overcoming of boundaries can, under certain circumstances, also imply the reference to non-scientific knowledge. Additionally to the explanation of content (the non-specific challenges) it often also discusses the change of these. Transdisciplinary efforts include therefore often, but not always, an interest in changes of these challenges. (2012: 23)[11]

This understanding of transdisciplinarity therefore also means that transdisciplinarity goes beyond multidisciplinarity and interdisciplinarity as it includes a synergy of different disciplines or theories, not a coexistence of them (Büchner 2012). Miller (2011) argues that social work cannot be described sufficiently without the concept of transdisciplinarity. Summarised, this means that the different concepts and understanding of transdisciplinarity have an influence on the way social work as a profession is understood. This applies to the context of scientific research as well as to the context of praxis. The questions underlying these theories and concepts include questions such as, 'What is knowledge for the profession?' 'How should professionals deal with knowledge?' and 'How can the social work profession position itself in the context of other disciplines and knowledge from other disciplines relevant for practice?' (Büchner 2012, Miller 2011).

[11] Translated by the writer.

Mittelstrass defines *trans*disciplinarity as a development following i*nter*disciplinarity. He argues that transdisciplinarity is mainly important in the context of research not in the context of practice (2003; cited in Büchner 2012). Büchner (2012) contrasts this understanding of transdisciplinarity with Obrecht's concept, which states that transdisciplinarity is a theoretical integration of heterogeneous knowledge on a meta-level whereby the basis for interdisciplinarity is transdisciplinarity of applied science. This means that his theory does support 'the dissolving of the different disciplines but the support of theories that account for problems that cross the boundaries of the disciplines and therefore the theoretical integration of disciplinary boundaries' (Obrecht 2002; Büchner 2012: 78).[12] Obrecht supports a knowledge integration system of five levels: metascience (I), object theories (II), general normative applied theories (III) and specialist applied theories (methods) (IV) and the level of reality (V). Level II would include the psychobiological knowledge and its derived applied theories and methods (Büchner 2012: 73–74; Obrecht 2003).[13]

Kleve (Kleve 2006; cited in Büchner 2012) argues that transdisciplinarity does not only involve the integration, but also the co-ordination of knowledge from different disciplines. From his understanding of knowledge and science, in the current situation of social work or social science, a postmodern form of science is possibly already based on transdisciplinarity. Kleve also formulates methods of theory analysis on three different levels: analysis of content, analysis of the system level (here, biological, psychological and social) and the analysis of social systems and policies (Büchner 2012: 54-55).

Büchner summarises the concepts of Kleve and Obrecht as follows: Kleve understands transdisciplinarity as a scientific endeavour which co-ordinates and

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12 Translated by the writer.

13 *Ibid.*

combines different theories. This is in contrast to Obrecht, who sees transdisciplinarity as an ambitious future goal for social work, which incorporates an integration of science for the application in practice (2012).

Hanschitz et al. (2009) refer to transdisciplinarity in the context of practical-participatory transdisciplinarity, which includes the transfer and translation of knowledge into practice. The transfer and the translation of knowledge into practice are also differentiated in these concepts: Obrecht, for example, argues that knowledge should be mainly provided by the international community of social work, whereas Kleve does not adhere to this approach as strictly (Büchner 2012).

Although these different concepts each have a different emphasis and therefore a different outlook for social work as a profession, it can be concluded that the way that knowledge is integrated from other disciplines is an important consideration for researchers, lecturers, knowledge providers and practitioners in the field. It plays a role in the way the professional identity is built and maintained and how core qualities and competences are established.

Therefore, a strong link to the theory-praxis dilemma of social work is made the subject of discussion (Büchner 2012). These aspects are to be debated over this dissertation. Here, no study on the complex process of how knowledge is utilised from science to the day-to-day practice in juvenile justice in Scotland could be identified. Additionally, no study about the conceptualisation of neuroscientific knowledge in use in a practice field like juvenile justice could be found. This is a gap in the literature, where this PhD dissertation can add valuable insight.

7 Conclusion

This chapter has provided an overview of the relevant theoretical literature. The chapter has begun by briefly summarising key neuroscientific findings, which could be relevant for for juvenile justice practice. Here, mainly research findings on neurodevelopmental research with a focus on attachment theories; stress responses and cortisol were outlined. Additionally, findings from research on neurotoxins, hormones and neurotransmitter and their influence on brain development were highlighted. Brain imaging studies were briefly described and a short paragraph on neurophysiology and gender studies has concluded the short excurse. This was then followed by possible applications in practice by citing studies on the influence of neuroscience on American judges and court rulings and a study on neuroscience and psychopathology. After providing this overview, the link to concepts of knowledge, 'evidence-based practice' as well as practice or professional wisdom was made and the relevance of investigating of the knowledge utilisation process from a different discipline, here neuroscience, for juvenile justice practice was established by concentration on concepts of transdisciplinarity and professionalisation of practice.

4 Epistemological and Ontological Orientation

1 Introduction

In social science, there are various different epistemological approaches to the understanding of knowledge and knowledge generation. The ontological approach for this study is based on a reflexive and interpretative approach. The underlying orientation is neither based on ideas that can be summarised under the heading of social constructionism, nor under the heading of realism. By using positions developed by Foucault, Hacking, Latour, Bowker, Star and Griesemer, as well as the initiative 'Critical Neuroscience', the epistemological orientation used in this dissertation focuses instead on an approach that tries to include both, and thereby goes beyond this distinction (Coudhury and Nagel 2009).

The following subsection starts by introducing a reflexive and an interpretative approach, before social constructionism as well as realism are briefly portrayed. It is argued how both perspectives are useful for this dissertation. This is then followed by an overview of additional important positions of Foucault on issues such as classifications, discourse and power. This leads to a brief summary of Hacking's work on the looping effect and the concept of 'making up people'. These theories are then combined with ideas developed by Latour and Star and Griesemer, which give additional insight into the underlying approaches used for this project.

2 An interpretative and reflexive approach

According to Ritchie and Lewis, interpretivism means that 'the social world is … mediated through meaning and human agency' (2003: 17), which is an assumption underlying this project. The aspect that the researchers and their social world interact with each other (Ritchie and Lewis 2003) is particularly relevant for this project as the focus is on interviews with relevant professionals. An impact through the interview process could be expected; it was therefore necessary to use a reflexive approach. Consequently a critical review of interpretations has been a guiding principle throughout this project. This ensured that the implications of interaction between 'researched' and 'the researcher' are as transparent as possible (Ritchie and Lewis 2003).

During my professional practice, questions arose how neuroscientific knowledge ends up in practice, if the knowledge used in practice agrees with findings in the laboratories as well as if there is a possibility for neuroscientific research to enhance social work practice. These questions and my personal academic and professional history have supported the research process and is reflected upon in the concluding chapter.

It is crucial, to be considerate of the 'insider-outsider debate' plays at this point. This debate applies at different levels for this research project due to my personal background in training (social work degree in Germany) and working experience (as a social worker in Children and Families Teams in Scotland). It could therefore be said that I am an 'acquaintance' (Ritchie and Lewis 2003: 34) as well as an 'insider' (Merton 1972). On the other hand, I have so far no experience of working in a youth justice team. Here, I would be classified as an 'outsider' (Merton 1972) as I have only theoretical knowledge in this respect. The consideration of focusing on

youth crime, instead of for example, child protection was based on these considerations as this ensured a more distant and neutral perspective during the research process. This would have probably not been possible in other areas of work within children and families services due to my practical experiences.

Insider knowledge, here due to practical working experience as well as academic knowledge, 'can help the researchers to make judgements about how to explore issues in more depth' (Ritchie and Lewis 2003: 65). This was certainly useful during the data collection process and the general development of this dissertation as I am familiar with general working aspects of children and families services.

However, as I can be considered an outsider to the specifics of youth crime, it was possible to avoid bias in this respect. The connecting element between the work in generic children and families teams and the work in youth justice teams is the fact that aggressive behaviour plays a role in both settings alike as service users might struggle with aggressive behaviour themselves or have experienced aggressive behaviour in the past. It might therefore be possible to generalise the findings from this dissertation to both areas of practice.

It is now important to introduce the used ontological orientation.

3 Realism

Realism stands close to positivism:

> the natural and the social science can and should apply the same kinds of approach to the collection of data and to explanation, and a commitment to

> the view that there is an external reality to which scientists direct their attention (in other words, there is a reality that is separate from our descriptions of it. (Bryman 2012: 29)

For this project, neuroscientific knowledge was part of the data analysis process. From a realist perspective, neuroscientific knowledge directly conceptualises what is real (empirical realism) or at least, it portrays what we now understand to be real (critical realism) (Bryman 2012).

4 Social constructionism

On the other hand, Burr (2003) has established several points social constructionism entails:

- A critical stance towards taken-for-granted knowledge;
- Historical and cultural specificity;
- Knowledge is sustained by social processes;
- Knowledge and social action go together.

(Burr 2003: 2-5)

Social constructionism 'is concerned with meaning and understanding as the central feature of human activities' (Lock and Strong 2010: 6). Social constructionism views knowledge as a product of social interactions and language as well as culture and history: 'The goings-on between people in the course of their everyday lives are seen as the practices during which our shared versions of knowledge are constructed' (Burr 2003: 4). Alternatively, as Lock and Strong put it, 'is the view that meaning and understanding have their beginnings in social interaction, in shared agreements as to what these symbolic forms are to be taken to be' (2010: 7). An example here

would be Moss and Petries's analysis of the construction of 'childhood' in the context of discourse, policy and practice of British social work and education:

> This dominant discourse has constituted childhood as located within the private domain. It has constructed the child as dependent and individualized, with a recognized and necessary place in the family but not in society. It has defined the 'normal' child in terms of following a universal and biologically determined sequence of development until the completeness of adulthood is achieved. (Moss and Petrie 2002: 239)

This construction of children and childhood within a society results in certain institutions, legal bills, interventions and practices around children. Here, particularly, psychology is placed in the focus of attention:

> Not only has developmental psychology offered a model for constructing normality, it has also provided the means for classifying and identifying the abnormal child, enabling the articulation of a deficit view and policies to address the deficiency. (Moss and Petrie 2002: 238)

These different constructions of meaning and understandings then result in different actions: 'Our constructions of the world are therefore bound up with power relations because they have implications for what it is permissible for different people to do, and for how they may treat others' (Burr 2003: 5). From this perspective, concepts like 'truth' or 'facts' seem to become obsolete as everything is viewed from a certain perspective and with a certain interest. The power relation in this context becomes of particular importance for a social constructionism perspective.

> By defining groups in particular ways and maintaining records that gave material qualities to the construction of groups, populational reasoning 'normalized' certain characteristics. What were socially constructed criteria appeared in time as 'natural attributes' (e.g. 'racial' characteristics). The construction of groups and specific group characteristics emerged at a very specific historical moment. The art of governing required a kind of

> 'governmentality' related to the role of the state as a definer, watcher and manager of difference. (Moss and Petrie 2002: 236)

Therefore, social constructionism implies 'that social phenomena and categories are not only produced through social interaction but that they are in a constant state of revision' (Bryman 2012: 33). Social constructionist perspectives have, of course, not been without criticism by various different actors, mainly around the perspective of some form of objectivity. However:

> Neither the work of Strauss et al. nor that of Becker pushes the constructionist argument to the extreme. Each admits to the pre-existence of their objects of interest (organisation and culture respectively). However, in each case, we see an intellectual predilection for stressing the active role of individuals in the social construction of social reality. (Bryman 2012: 34)

This study investigates how the different emphasis of these two approaches to the way we view the world influence the way knowledge is perceived, conceptualised and portrayed. Although it can be argued that social construction plays a role in the majority of human actions, it cannot be denied that there are also pre-existing determinations that are not socially constructed. This summarises the underlying assumption of this study. These were combined with themes from important philosophers and sociologists, which are discussed over the next subsection.

Pickersgill has summarised the activities of Science and Technology Studies (STS) academics as follows:

> STS academics seek to highlight the ways in which technoscience [science and technology] is a social endeavor. Like all forms of knowledge, it is generated through social processes made possible by a wide variety of practices and institutions that include political decision-making, funding bodies, experiments, collaborations, dissemination, and contestation. (Pickersgill 2011: 383)

Although not all of the thinkers who influence this work can be added to the area of Science and Technology Studies, this summary gives a brief overview how the following themes fit together.

5 Discourse, classification and power relationships: Michel Foucault

Discourse and its relationship to power play an important role in the work of Michel Foucault:

> The process whereby a person becomes the subject of the power of the discursive system they are defined by. This power does more than dominate or coerce people into acting in certain ways: it also has a constructive side, in that in being subjected to a discourse one is simultaneously created as a person of a certain sort. (Lock and Strong 2012: 247)

For Foucault, there is a strong connection between the ways we understand the world and what language and discourse we use. Additionally, this is influenced by the way power is established, maintained and portrayed:

> each society has its regiment of truth, its 'general politics' of truth: that is the types of discourse which it accepts and makes function as true, the mechanisms and instances which enable one to distinguish between truth and false statements, the means by which each is sanctioned; the techniques and procedures accorded value in the acquisition of truth; the status of those who are charged with saying what counts as truth. (Foucault and Gordon 1980: 131)

This is particularly relevant in the context of social work and juvenile justice practice; the discourse of certain aspects of knowledge in this setting might influence

the way juvenile practice is undertaken, how clients and service users are viewed, and how the role of the practitioner is established and maintained.

Classification

Another important aspect in this context is classification, as people in the role of power, here, in juvenile justice settings and neuroscientific publications use certain methods of classifying certain kinds of behaviours.

> How we classify will depend on which 'framework' we inherit and, because different systems of classification are inherited in different cultures, how the members of those cultures classify will be different: different conventions for classification will exist in different cultures. (Barnes and Bloor 1996: 48)

Of course, classification is something that happens in everyone's life every day: for example, in the form of standards, categories and codes in commercial and bureaucratic products (Bowker and Star 2000). However, in the context of behaviour and youth crime, classification needs to be viewed with special care: 'Classification systems in general inherit contradictory motives in the circumstances of their creation' (Bowker and Star 2000: 66). This means, that here, categories are established with a certain perspective and idea of what is normal and accepted behaviour. Therefore, the politics of classification systems and the way they are used, facilitated and established in practice are important to investigate. Additionally, different social worlds also have different ways of classifying items of behaviours, or as Bowker and Star argue: 'different social groups tend to have quite different prototypes in mind when classifying something as, say, a piece of furniture' (Bowker and Star 2000: 10). For Foucault, for the formation of classification systems, power is the central concept. For example, in his work *The Archaeology of Knowledge* (1989), he explores the origins of categories and practices where the focus is on social order and its consequences. Bowker and Star state that it

is not only the establishment of categories and classifications that Foucault has investigated, but also that:

> These standards entailed a range of governmental activities, including accustoming citizens to the regular collection of information about ever more detailed aspects of their personal lives. Standards also meant enforcing a standardized set of procedures. (2000: 117)

The use of classification and standardisation through assessment tools for children and families services is a widely debated and controversially discussed topic. This is, therefore, relevant for this dissertation; here, particularly the understanding of aggressive behaviour is at the core of this analysis. Classifications can often be found in contrast to the wider understanding of social work and its ethical values: the when and why questions and the understanding of underlying psychological and sociological processes often stand in contrast to a classification of behaviour which has the tendency to reduce the perspective to a problem and locate it in the individual, or, as Rose puts it:

> The essential point is, that claims as to the neurogenetic base of such DSM-IV categories as attention deficit hyperactivity disorder, oppositional defiance disorder, antisocial behaviour, and others serve first to reify, then to locate and fix, socially defined forms of undesirable thoughts and behaviours in a causally directional manner within the individual, within his or her brain and genes, rather than in a relationship between the individual and their economic, social, and cultural environment. (Rose 2012: 64)

6 Boundary objects and social worlds: Bowker, Star, Griesemer and Strauss

'A social world is a group with shared commitments to the pursuit of a common task, who develop ideologies to define their work and who accumulate diverse resources needed to get the job done' (Gieryn 1995: 412). Strauss has established that social worlds share at least one activity and use specific locations and 'technologies' to carry out the activities where usually an organisation promotes these activities (Strauss 1978).

Different actors in heterogeneous environments define boundary objects as abstract or concrete 'objects' that manage to overcome different viewpoints in different professions and viewpoints. They are differentiated into repositories, ideal types, and coincident boundaries and standardised forms (Star and Griesemer 1989). Boundary objects are 'Star and Griesemer's concept of elastic boundary objects promotes our understanding of translation efforts in the management of collective work across social worlds' (Fujimura 1992: 175). The boundary object is an 'analytical object of scientific objects which both inhabit several intersecting social worlds and satisfy the informational requirements in each of them' (Star and Griesemer 1989: 393). Star and Griesemer differentiate four different forms of boundary objects:

- Repositories: loads of objects organised in a standardised form, for example, a library or a museum.
- Ideal Types: are mostly fairly inexplicit and abstracted objects, for example, the concept of species, which supports communication and cooperation: 'a good enough road map'.
- Coincident boundaries: objects, which have the same boundaries but different internal contents; specifically important across larger scale geographical areas, when the same type of work is undertaken at different sites autonomously, but with a shared referent.

- Standardised forms are formulated as methods of communication across spread out work groups.

(Star and Griesemer 1989: 393)

For this dissertation, particularly the perspectives of the different involved professions, or social worlds, on the term 'aggressive behaviour' were investigated in the context of boundary objects.

7 'Making up people' and the looping effect: Ian Hacking

Hacking has further developed the concept of classification of people and its impact on their identity and their behaviour: 'Classifying changes people, but the changed people cause classifications themselves to be redrawn' (1995: 279). In the context of the looping effect, it is first important to note Hacking's understanding of human kinds:

> When I speak of human kinds, I mean (i) kinds that are relevant to some of us, (ii) kinds that primarily sort people, their actions, and behaviour, and (iii) kinds that are studied in the human and social sciences, i.e. kinds about which we hope to have knowledge. I add (iv) that kinds of people are paramount; I want to include kinds of human behaviour, action, tendency, etc. only when they are projected to form the idea of a kind of person. (Hacking 1995: 354)

The most important distinction between human and natural kinds in Hacking's understanding is the fact that human kinds are value laden. One of his used examples for human kinds is homosexuality. He believes that there is a trend to classify behaviour and people to gain a better understanding and prediction of their actions and how we can best intervene and avoid unwanted behaviours or actions. He finds this approach very similar to the approach used in the natural sciences. Here, the hope is to establish a recipe with a good enough classification that

eventually leads to knowledge of the true causation of actions and behaviours (Hacking 1999). He states, that there is a growing number of experts in the field of social work, psychiatry, psychology, and so forth, which try to differentiate between normal and deviant behaviour based on theoretical studies and knowledge. The result is, that everyone thinks that that these practitioners are then equipped to provide successful interventions to these people (Hacking 1999). Additionally, he observes that:

> There is a regular attempt to strip human kinds of their moral content by biologizing or medicalizing them. Child abusers are not bad; they are sick and need help! Their crimes are not their fault. They were abused as children, and that is why they abuse their own children. … The world would be a better place if there were no … child abusers/juvenile delinquents … etc. But let us not blame them, let us medicalize them. This fits well with the metaphysical thrust that I mentioned earlier, that somehow causal connections between kinds are more intelligible if they operate at a biological rather than a psychological or social level. (Hacking 1999: 367)

According to Hacking, is the consequence of these classifications attempts is the looping effect.

> The looping effect … is a cycle of changes. It is composed of two basic stages. (a) There is an effect on people who are classified. There is a classification K of people, which is made as part of our scientific knowledge. Associated with K are what are conjectured to be laws or regularities about people who are K: At least some people thus classified change their behaviour in consequence of being so classified. (b) It may be necessary to change the criteria or the knowledge about people who are K, because in virtue of the classification, they no longer fit the old criteria. Or at any rate, one may have to modify the regularities about such people, not because one was wrong in the first place, but because the people have changed somewhat. This, in turn, may affect the people classified, and looping may continue. (Hacking 1995: 297)

An example here would be the alleged discovery of a connection between genes and violent behaviour. When the public knows this information, people who allegedly have this inherited biological trait, then consequently develop more aggressive and

violent behaviour due to their knowledge. This, in turn, is then assessed by professionals as more violent than initially determined. As a consequence of this effect, the kind changes:

> Then, whatever was the case to start with, we really would get new strong correlations, not caused by anything genetic, but caused by the classification itself. And the experts would discover that these individuals are far more dangerous than was previously thought. (Hacking 1995: 298)

These considerations supported the formulation of the discussion and findings, how neuroscientific knowledge impacts on attitudes and perspectives of practitioners in respect of services users. Hacking's contemplations and theories have therefore provided this thesis with important ideas that have shaped the analysis of the research questions.

8 'Black-boxing': Bruno Latour and Michael Barnes

In Latour and Woolgar's early work, the process of research in laboratories was closely examined; how this knowledge is established and how research is undertaken was investigated step-by-step (1986). This ethnographic study 'concerns the way in which the daily activities of working scientists lead to the construction of scientific facts' (Latour and Woolgar 1986: 40). Latour has defined the process of black-boxing as:

> the way scientific and technical work is made invisible by its own success. When a machine runs efficiently, when a matter of fact is settled, one need focus only on its inputs and outputs and not on its internal complexity. Thus, paradoxically, the more science and technology succeed the more opaque and obscure they become. (Latour 1999: 304)

In the context of this dissertation, an example of black-boxing would be 'brain mapping.' Rose argues, that:

> A lot, then, is 'black-boxed' in that image, and brain mappers themselves view with some concern the proliferation of these images as if they were simple photographs or X-Rays, and their utilisation in popular and professional discourses. Nonetheless, the images have undoubted power. Scans of the brains of children from Romanian orphanages, for example, have been deployed to give us hard proof at last of the importance of early mother-child interaction – it is written in the brain. (2010: 75)

It can therefore be concluded that black-boxing in neuroscientific research has an influence on the way results are presented, conceptualised and portrayed. This was particularly important for the analysis of the process neuroscientific research undergoes from the laboratory to its utilisation in practice.

9 Critical Neuroscience

In the context of critically examining the influence of neuroscientific research on juvenile justice practice, the approach of 'Critical Neuroscience' deserves some attention. Choudhury and Nagel define Critical Neuroscience as:

> a reflexive scientific practice that responds to the social and cultural challenges posed both to the field of science and to society in general by recent advances in the behavioural and brain science. By sketching a multidisciplinary form of critique, we suggest a framework of analysis and practice that could help to provide a theoretical foundation for projects aiming at critical reflection on new developments in neuroscience and the cognitive sciences more broadly. (2009: 62)

Critical Neuroscience therefore uses a deconstructive perspective on findings and representation of these findings to the public and how this is perceived,

conceptualised and included in the day-to-day life of lay people and professionals. Slaby argues that:

> We need to pay specific attention to what is brought forth as allegedly natural, as natural facts, in and around contemporary neuroscience (and of course also in other areas of the sciences, where applicable), especially where it is relevant to human conduct and human affairs more broadly … What stories are being told, who tells them and why, and what is ultimately informing and driving these stories? (2010: 405)

In order to answer these questions, different concepts from Science and Technology Studies as well as from scientists like Foucault (1989, 1980), Hacking (1995, 1999) and Rose (2010) are used, to name just a few. Slaby states that:

> Instead, the physical appearance and aesthetic quality of the shiny new and clean technology seems to work as a 'placebo space' – a dream factory that fuels the imagination to fantasies of healing and unlimited possibilities of medical intervention. One could thus be led to assume that through processes of the kind described by Cohn, neuroscience might in the end succeed in achieving a naturalization of subjectivity – not by proving successful scientifically, but by offering the most attractive, most persuasive images and narratives of self-objectification. While it aspires to be a 'hard' science delivering new facts about humans, it might in the end be more of a generator of technoscientific dreams and fantasies, constructing ideas and images that offer a new self-understanding. (2010: 25)

Critical Neuroscience hence investigates how neuroscientific knowledge is conceptualised, perceived and interpreted by the public and/or other professions. This dissertation therefore fits in the wider range of research projects undertaken by the loose community of 'Critical Neuroscience'. A criticism critical neuroscience employs on neuroscience is that:

> By creating the impression that it is on the verge of uncovering the complex neural underpinnings of human traits, capacities, and pathologies, neuroscience discourages the view that a person's traits are importantly shaped by ecological conditions (Slaby 2010: 407).

This was particularly important for this project as for social work theories usually the influence of wider societal developments, ecological conditions and sociological dimensions play a significant role for the development of children and problematic behaviour. Critical Neuroscience particularly criticises how neuroscience is established, and portrays itself as being a positivist science which establishes facts and a truth, whilst, in actuality, several of these 'facts' can be seen under a social constructivist perspective.

However, Critical Neuroscience tries to move away from this clear distinction between social constructionism and realism (Coudhury and Nagel 2009). Critical Neuroscience is based on historical analysis of the process of how some questions become of concern for neuroscience: technical and conceptual analysis of research processes; ethnographic analysis of the neuroscientific research process; the examination of the public engagement process with this knowledge; the influence of funding on the research process; the analysis of the social, political and cultural aspects of research agendas; and the examination of scientific practice of neuroscientists (Choudhoury and Nagel 2009).

10 Conclusion

This chapter has summarised the ontological and epistemological assumptions underlying this dissertation. The reflexive and interpretative approach is particularly important for this dissertation due to my own practical experience as working as a children and families social worker in Scotland for many years, as it helped to guide the interpretation of data by avoiding bias or 'blind spots'. This approach was used as a guiding principle underlying the data collection and analysis phase; the results of this process are summarised in the concluding chapter.

The project was placed between a realism and a social constructionism perspective. Due to the different subjects areas under investigation, namely social work and neuroscience, the approach used is not denying the existence of pre-existing objects, however, it is also, on the other hand, not denying the fact that the social constructionsim perspective needs to be considered when investigating knowledge utilisation, transfer and translation in the field of neuroscience and social work services. Additional concepts from Foucault on discourse and power relations, concepts on classification and Hacking's looping effect, Strauss's social worlds and Bowker and Star's boundary object were used as well as the idea of black-boxing (Latour and Barnes) and concepts from Critical Neuroscience. These different concepts and ideas have supported the analyses of the collected data and provided a conceptual framework to clarify the primary principles and orientation for this dissertation.

The following chapter provides information on the research strategy and methodology used during the data collection and analysis phase of this dissertation.

5 Methodology

1 Introduction

The following chapter presents the applied research strategies and methods. The chapter begins by describing the general research design by introducing the aims and objectives of this study. This is then followed by the research questions and research strategies used for this thesis. Here, the data collection and analysis methods are described by paying attention to sampling and negotiating access. The case study approach is explained and the reflective approach is introduced. This is set in the context of validity, reliability and generalisation of the research findings.

2 Research Design

The following section describes the research design based on the background described in the previous sections. The project is a contemporary, explorative and analytical study. The general research approach is based on qualitative research methods.

2.1 Aims and objectives

The main question of the project was to investigate how findings from neuroscience influence juvenile justice practice. In order to explore this question and gain knowledge and an understanding of this process, the project investigated the day-to-day practice with aggressive juvenile offenders. The study aim was to explore how concepts from neuroscience inform juvenile justice practice; how those concepts are translated from research into practice; how neuroscientific knowledge is conceptualised by practitioners and training providers, how neuroscience, and consequently how neuroscientific concepts, are transformed in the process of translation and adoption. The study objective was to inform policy, training and practice in respect of knowledge utilisation and the conceptualisation of neuroscience in the context of a professionalisation of practice in this specific field.

2.2 Research strategy

The next subsection discusses research strategies and methodologies used in this dissertation. Additionally, methods of data collection as well as analysis to approach answers to the above outline questions are considered under aspects of sampling, time frames, validity, reliability and ethical considerations.

In order to find answers to the above raised questions, the general research strategy was based on induction to develop theories about knowledge utilisation in this area (Blaikie 2000). Here, the focus was on patterns analysed from qualitative interviews and focus groups, whereby the observations were generalised to form conclusions (Ritchie and Lewis 2003).

It was decided to reduce the area of investigation to 'aggressive behaviour', as this is a complex form of behaviour, which is part of the daily practice of juvenile justice

practitioners. It was assumed that all the interviewees have theoretical and practical experience with this particular form of behaviour. This hypothesis was verified during the data collection process and additionally, an extensive amount of neuroscientific publications focus on this specific form of behaviour. The concentration on one specific form of behaviour allowed a focus on an area with distinct boundaries, which in turn resonated with a structured research process.

2.3 Research questions

- What is 'neuroscience' in the view of juvenile justice practitioners?
- What neuroscientific concepts, theories and results do juvenile justice practitioners use in their day-to-day work? How are these employed in practice?
- How is this practitioners' knowledge similar or different to the neuroscientific findings from which it derives? How, and in what ways, does it differ?
- How does the process of translation between neuroscience and juvenile justice take place? What is the role of professional mediators, such as social work trainers?
- How is the use of neuroscientific concepts in practice shaped by the practice context?

These questions can be differentiated as follows:

– What is classified as 'evidence' of aggressive behaviour in the juvenile justice system as well as in neuroscientific research studies?
– What concepts of aggressive behaviour are in use in practice?
– What neuroscientific knowledge does exist on practitioner levels?
– What is classified as evidence in the process of formulating methods and practice guidelines with regard to neuroscientific findings?

- What is classified as evidence in the context of 'knowledge' of practitioners in relation to neuroscience?
- On what grounds are decisions made as to whether knowledge is useful, valid or true?
- How is neuroscientific knowledge translated, discussed, negotiated and included in practice (and policies) and methods under consideration of controversies, externalisation of claims, simplification and reduction?
- How is neuroscientific knowledge translated, discussed, negotiated and included in practice (and policies) and methods under consideration of practical restraints?
- How do professional values influence the translation of neuroscientific knowledge?
- Why is some neuroscientific knowledge translated into practice and others not?
- Does knowledge from neuroscience change practice or enhance understanding of problematic and criminal behaviour?
- How do philosophical belief systems (such as a welfare approach as opposed to a punitive approach) influence the acceptance and interest in specific knowledge?
- What concepts do practitioners have of neuroscientific knowledge?
- How and where do they get neuroscientific knowledge?
- What role do training facilitators play in the process of simplification and translation of the knowledge?

(Appendix 1)

2.4 Case study approach

The dissertation is based on a case study approach, whereby Scotland and its councils were categorised as a case. The case study design was chosen as the

proposed research project investigated a 'contemporary phenomenon in-depth and within its real-life context … and the boundaries between the phenomenon and the context are not clearly evident' (Yin 2009: 18). Further, the research questions were mainly 'How?' and 'Why?' questions and therefore a case study design was the most appropriate for this project (Yin 2009). Additionally, the case study approach allowed enough flexibility to change aspects of the study during the research process.

In order to ensure a systematic collection of the data, the gathering of these documents and interviews was based in groups according to the within-unit of analysis of the case study approach (Table 1).

Table 1: Overview of the case study approach

Unit of Analysis	**Scotland**	**Scientific Publications**
Within-unit of analysis 1a	Practitioners and Team Managers	
Within-unit of analysis 1b	(In-house) Training Facilitators	

Credibility of the findings was ensured by transparency about the process of data collection and data analysis (Sapsford and Jupp 1996). The typology for the case study design was based on a main unit, namely Scotland, which was broken down into two subunits to build the within-unit of analysis 1a: practitioners of the Youth Justice Teams (Senior Social Worker, Psychologist, Youth Care Workers, Youth Justice Programme Manager, Team and Service Manager) and the within-unit of analysis 1b, which included (in-house) training facilitators, who were involved in the knowledge translation and preparation process. The data collection was completed by the study of policy documents, guidelines and protocols in use by the

different Youth Justice Teams. Additionally to relevant literature, 14 articles in the field of neuroscience were explicitly investigated. The chosen 14 articles, all published in journals, were chosen based on the following criteria:

- Published within the last 15 years;
- According to the *Web of Knowledge* by Thomas Reuters,[14] they were all cited more than five times;
- Focus of the study was on the relationship between cortisol and aggressive behaviour.

It is not claimed that the list of studies about the relationship between cortisol levels and aggression is exhaustive, but it was important to contrast the interview data with scientific publications. Due to the vast amount of scientific publications in the field of neuroscience, one small area of research, namely the relationship between cortisol and aggressive behaviour, was chosen for this investigation. The reason for this can be found in the fact that this specific field of research is fairly well defined and is therefore useful for analysis and investigation.

As argued by Bechhofer and Paterson: 'the relevance of comparison and control is undoubtedly conditioned by the policy context' (2000: 133). The area of juvenile justice is strongly influenced by the current political climate and it is therefore useful to have a comparative element in the research project. The case selection was based on the Method of Similarities suggest by Mill (1843), as opposed to the Method of Differences. The reason for this is that the project 'compares political/social systems that share a number of common features as a way of neutralizing some differences while highlighting others' (Lewis-Beck and Bryman 2004: 98). The similarities and common features, so-called 'contextual variables' (Lewis-Beck and Bryman 2004), were present as all juvenile justice practice is based in the context of the Scottish Legislation and the Children's Hearing System and the Criminal Justice System.

The reason for choosing more than one council was that the various local authorities are structured in different ways and have diverse emphases in their work with juvenile offenders (Burman 2008). For example, cities usually have more young offenders involved in gang violence than rural areas. Additionally, a youth justice team can have strong links to child and adolescent mental health services (CAMHS) and there can be a mental health nurse within the team. In another youth justice team, a psychologist might be part of the staffing. Some local authorities do not have specialist youth justice teams (anymore). It is therefore argued, that there are significant differences between councils' approaches to juvenile justice. This results in different cultures across the councils and, arguably, has an influence on the knowledge present across the various teams. This cultural dimension of the different local authorities is important to include in the research and explains why the focus is on the teams rather than on the individual professional. These differences were relevant in discussion with service managers or senior manager and team leaders of youth justice teams (1a) to gain more information on the political level.

A case study with a comparative component allows more insight into the named research project than an investigation of practice and policies that only one council might achieve, and adds the element of control (Sartori 1994). Additionally to the different practitioners in the councils, agencies like INCLUDEM (Project Manager, Programme Developer and Deliverer) as well as secure unit practitioners and managers were included. Although youth justice teams and practitioners undertake the assessments and make decisions about the necessary methods and aims in working with juvenile offenders, the additional information from the other agencies and organisations did give more depth and a broader range of data to the analysis.

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[14] http://wokinfo.com/

3 Data collection

The data collection was focused on qualitative methods, as it was planned to reach an in-depth understanding of the translation of knowledge from research to practice in a specified area. According to Creswell (1994), qualitative data collection methods are appropriate when a process is explored and a descriptive way is useful to gain understanding. For this dissertation, the focus was on the question of how the knowledge influences practice. It would not be useful to investigate this with mainly quantitative methods, as the focus was on the exploration and description of this question, which cannot be achieved by quantitative measures. The foundation of research was a document analysis of relevant policy documents as well as an in-depth analysis of relevant publications in the field of neuroscience. This allowed the qualitative research to be linked to current policy frameworks as well as relevant neuroscientific knowledge.

Interviews

The main data collection methods were interviews with practitioners and service/senior management in local government and relevant agencies and institutions (Appendix 2, 3 and 4). These interviews were based on an investigation of policy and programme documents, which are in use by the respective employer of the interviewee. The knowledge base of these practitioners was the main focus of interest for this project. Also, professionals are relevant for either development or implementation of policies, or for the practical experience with these policies, and therefore hold valuable knowledge for the data collection. Interviews with service/senior management were undertaken to investigate the general political trend that underlies policy developments, as well as wider expectations about the professional development of practitioners. As post-qualifying training for

practitioners is mainly offered on a local level, in-depth interviews with in-house training providers and in-house training consultants were held. It was assumed that training providers are involved in the process of translation of scientific knowledge, therefore, are 'translators' and hold valuable knowledge and insight for this project.

Focus groups

In addition to the interviews, focus groups were held. The reasons here are as follows: Bryman (2012) argues that focus groups allow a wider range of different views to be integrated into the analysis and the participants have more room to bring forward their own points of interest, or significant points, than in individual interviews. The reason here is that during a focus group, the interviewer has less control over the discussion compared with a one-to-one interview. This is an important aspect within a reflexive approach, as this might help to overcome some of the 'insider' issues discussed in the previous section.

As juvenile justice practice involves working as part of a team and is influenced by professional attitudes, it was decided to include focus groups in the research process. According to Ritchie and Lewis, focus groups can be used to verify findings and the understanding of the findings (2003). Although practical difficulties of using focus groups with experts had to be overcome (Dexter 2006), two focus groups were undertaken.

Additionally, focus groups allow the interviewees to challenge each other or discuss more controversial arguments than during interviews. These controversies are also relevant for the analysis of the process of conceptualisation of certain themes (Bryman 2012). The question of conceptualisation is a key aspect in some of the research questions. Due to the social interaction of the participants this can be

explored in more depth during a focus group, than would be possible through interviews. The consequence is that the overall analysed data are richer.

Elite or expert interviews

The group of targeted respondents are, or were specialist or experts in their fields and, therefore, belong to an 'elite' (Dexter 2006). In the German literature, however, these interviews are classified as 'Experten-Interview' (expert interviews) rather than 'elite-interviews'. The focus of the interview was only on a certain aspect of the interviewee's expertise and knowledge. It was not focusing on the person as a whole with their personal attitudes and experiences. The interviewee is an expert in his field, but does not necessarily belong to an elite group of society. This is not in contrast to Dexter's definition, but the used term of 'expert' is less controversial than the term 'elite'. As the suggested approach in this project considers interviews with juvenile justice practitioners, team leaders, service managers and training providers, and the focus of the interview is on their expertise and knowledge in their work rather than on their personal attitudes and beliefs, the term 'expert' interview is more suitable for this purpose (Dexter 2006). Following Dexter's advice, interviewees were chosen carefully to avoid being referred to 'one's own kind of people'. No particular consideration was given to matching the researcher to the interviewee or vice versa, as the researched topic was not expected to cause gender bias, social class or ethnicity issues (Richtie and Lewis 2003). Professionals working in the field of juvenile justice (for example, social workers) in the UK have been trained in evidence-based practice. The training, attitudes and abilities of these professionals are therefore shaped by expectations of the government, which has increased the emphasis on 'evidence-based practice' and the 'best practice' approach over the past decade. Here, basic pre-qualification training (for example, undergraduate social work degrees) as well as post-qualification training was relevant for investigation of the research topic. The reasons were that practitioners

registered with the Scottish Social Service Council have to undertake a certain amount of training days per registration period for their registration to continue. This continuing professional development (CPD) was of interest here, as new methods, research and tools and, therefore, new knowledge are introduced to practitioners to enable them to fulfil the requirements of their posts. Qualitative interviews give more results and better findings than questionnaires or surveys as more depth is achieved (Ritchie and Lewis 2003). The expectation was, as described above, that practitioners are influenced in their practice by various different forms of knowledge. It is not possible to retrieve tacit knowledge of practitioners from policy documents. Information about this knowledge can only be accessed via in-depth interviews.

Interview structure

The area of research concerns questions that involve knowledge, motives and reasons underlying the practice of juvenile justice and thereby includes professional values and beliefs of the specialists. Interviews of these specialists were therefore conducted on a semi-structured level (Ritchie and Lewis 2003). According to Ritchie and Lewis, this allows an in-depth analysis of the individual perspective of knowledge transfer from research to practice and therefore adds depth to the research process as a whole (2003). In-depth interviews are classified as semi-structured but flexible (Legard et al. 2003). In order to gain a deeper understanding of the subject, individual opinions and attitudes are of interest. Therefore, it is more useful to allow participants to explore their own thoughts and to gather extended answers. This permits more insight into thought processes. The semi-structured approach has supported the research process as it allowed covering certain topics and provided enough flexibility to adapt to new ideas or approaches during the interview (Dexter 2006). For the interview guide, particular attention was paid to the formulation of the proposed questions. For example, the wording of the questions

was open but focused (Rubin and Rubin 1995). According to Dexter (2006), expert interviews are more successful when a discussion rather than a question and answer style is used. All questions during the interview process were non-leading questions to ensure that the underlying meaning of the question did not influence the answers (Legard et al. 2003).

It has to be said that the term 'social worker' is used loosely throughout this dissertation; it also refers to youth care workers and practitioners in the different positions within a youth justice team and secure units. This is relevant, as the term 'social worker' is legally registered in Scotland. Most of the interviews and focus groups were transcribed; however, this was not possible for all interviews undertaken. When it was not possible to record the interview, taking notes retained the conversation. The following table gives clarification about the different professional roles of the interviewees.

Table 2: Interviews and focus groups: professional roles of participants within the different institutions across Scotland

Institution	Professional Role	Number of Participants
Secure Unit	Forensic Psychologist	3
Secure Unit	Psychologist	1
Secure Unit	Programme Worker	1
Secure Unit	Social Care Worker	1
Secure Unit	Manager	1
Local Authority	Social Worker/Senior Pract.	8
Local Authority	Psychologist	1
Local Authority	Manager	3
Local Authority/NHS	CAMHS Nurse/Practitioner	2
Local Authority	In-house Training Provider	3
Local Authority	Forensic Psychologist	2
Support Provider	Training Provider	1
Independent	Consultant	1
Independent	Training Provider	1
Independent	University Researcher	1
	Total	**29**

4 Sampling and negotiating access

The involved councils were chosen as they represent the areas of the highest population, and a mixture of urban and rural areas, and therefore give an overview that can then be generalised for the whole of Scotland. This was particularly important for investigating practice, as resources as well as policies and

programmes are often applied differently in rural areas than in towns or cities; for example, due to travel issues and population density and distribution.

Sampling interviews

The issue of sampling interviewees was decided after contacts with gatekeepers were made. An initial email was sent to the service managers of the different councils and agencies responsible for youth justice. In the chosen institutions this email was then followed up by an invitation to the youth justice teams, whereby a direct contact to the practitioners was established and meetings were organised. Additionally, in some cases, it was possible to arrange a meeting with the service manager or team manager to discuss the general approach to 'neuroscientific knowledge' within the context of politics. This ensured that the results are more in-depth and less biased than interviews with only one representative. This means that interviews with a maximum of five professionals per council were undertaken. The same approach was taken in respect of the secure units and agencies. The interviews were based on a policy analysis. Policies of local governments were included as preparation for the interviews; for example, the implementation of Intensive Support and Monitoring Programmes, as well as programmes offered by the local youth justice teams and social work services, were used as background information prior to the interviews. Due to the economic climate, a few councils have started to dissolve their youth justice teams and the workers were, and are, redeployed in generic children and family teams. This has led to problems in two councils, as juvenile justice practitioners were more difficult to identify and therefore the interviews could not take place.

Training providers and consultants were identified through the interview process. Contacts were made through information given by practitioners, as well as personal knowledge from working in children and families settings in Scotland.

5 Data analysis

The data analysis process was started during the document analysis process and continued throughout the course of interviewing experts. The data analysis was based on coding, theoretical saturation and constant comparison. These components are part of grounded theory (Bryman 2012). It has to be said, however, that grounded theory is not understood as an overarching theory or approach used for this dissertation (this also includes the used ontological or epistemological considerations) but rather as a combination of analysis strategies. Bryman cites criticism of grounded theory, developed by Glaser and Strauss, in this context as neglecting the role of the researcher in the process of data collection and analysis, and thereby using a more objectivist perspective on the world (Bryman 2012: 575). As this possible interpretation of grounded theory stands in contrast to the used ontological and epistemological orientation during this dissertation, the strategies used for this project were based on the ideas of grounded theory, but do not include the wider perspectives of this theory.

As proposed by Charmaz (2006), initial coding and selective coding were used to establish categories: first, the data were analysed by initial coding which included very detailed analysis and reviewing of the interview data. This was then re-evaluated and re-coded by selective coding. This process was undertaken various times and eventually resulted in theoretical saturation, whereby a point was reached when no new categories or concepts could be established (Charmaz 2006). During this process, the different developed categories and concepts were constantly compared. Bryman describes this process thus: 'It refers to a process of maintaining a close connection between data and conceptualization, so that the correspondence between concepts and categories with their indicators is not lost' (2012: 568). Bryman argues that: 'It is somewhat doubtful whether grounded theory in many instances

really results in theory' (2012: 574): Here, his critique of grounded theory was used, as the result of this dissertation cannot be classified as a 'formal theory' as rather it generates 'substantive concepts' (Bryman 2012: 574).

In addition, certain aspects of neuroscientific publications were analysed by using a discourse analysis based on Foucault (FDA) (Willig and Stainton 2008).

> Foucauldian version of discourse analysis is concerned with language and language use; however, its interest in language takes it beyond the immediate context within which language may be used by speaking subjects. […] Foucauldian discourse analysis asks questions about the relationships between discourse and how people think or feel (subjectivity), what they may do (practices) and the material conditions with which such experience may take place' (Willig and Stainton 2008: 112).

The six stages in the analysis process were utilised with a concentration on the following questions:

- How does the homepage and examples of publications from Dr. Bruce Perry (www.childtrauma.org) represent the discourse of neuroscience and trauma to the public?
- How will this position professionals and practitioners?
- What are the implications for social action(s) and the subjective experience of the actors within the discourse?

The analysis was based on the information provided on Bruce Perry's homepage, his book *The Boy Who Was Raised as a Dog* (Perry and Szalavitz 2006), and a sample of his published papers (Anda and Felitti 2006). Dr. Bruce Perry is a child psychiatrist and neuroscientist who plays a significant role in the knowledge utilisation process this dissertation investigates.

The focus of the analysis was on the presentation of his work on his homepage Childtrauma Academy[15], how this represents the discourse of neuroscientific research to the public and how this positions practitioners and what the implications for practitioners within this discourse are or were. The results were then again coded and compared with the codes and categories from the interview data.

The individual practitioners were part of teams as well as part of different councils. Therefore an argument could be made to approach the project from a systems theory perspective (for example, Karl Ludwig von Bertalanffy's general system theory). However, it was argued that for the theory development about knowledge utilisation, the focus on the individuals was more relevant than the system perspective, and therefore this approach was not used here.

Generalisation of data

The generalisation of the data was mainly in form of theoretical generalisation and but also in form of inferential generalisation (Ritchie and Lewis, 2003). Generally, a 'backward looking' approach was used, as the study investigates the influence of research findings practice (Nutley and Walter 2007). The concentration was on individuals in professional positions and their knowledge and, to a lesser extent, the influence of the institutions on the process (Hudson and Lowe 2004). The data collection started at the level of the individual with the view to establish a pattern across teams and councils by analysing the data to develop a generalisation of the results.

The main focus of the research project was the exploration of practice and knowledge of practitioners (1a) with regard to aggression as well as their construction of neuroscience, and the exploration of the knowledge of training

[15] http://www.childtrauma.org

facilitators (1b) as well as their role in the translation of neuroscientific research for practitioners.

Additionally, political trends and expectations about the training needed to be explored through the interviews with representatives from management level. This was combined with a backtracking of the 'practitioners' knowledge' in use with the academic neuroscience it is retrieved from.

Some key principles were used to ensure that the generation of qualitative data is done correctly: only original data were used, diversity was included (for example, if practitioners disagreed with each other on a certain phenomenon); the level of classification was taken into account during the phase of analysis; and the assigning of meaning and interpretation was done carefully (Ritchie and Lewis 2003).

It further can be argued that the project is 'multi-dimensional' (Hakim 1987), as it was necessary to examine issues on local and national level, in addition to the complex issues around conflicting interests in juvenile justice on the level of practitioners and the general political climate – these different elements have an influence on the knowledge practitioners use and have in their day-to-day work. The project focuses on practice rather than effects of policies. Therefore, it also involved an element of theoretical research, as the focus is on 'causal processes and explanations' and the overall aim was to develop social science knowledge (Hakim 1987). In this case, the clear distinction between practical, policy and theoretical research was not easily adapted, as the result of the project could lead to 'knowledge for action' as well as 'knowledge for understanding' (Hakim, 1987). The 'causal inference' as described by Bennett and Elman is best summarised as: 'the counterfactual approach looks to compare similar worlds and asks whether differences between them can be attributed to a change in a particular cause' (2006: 457). Here, similar worlds in this context are the Scottish juvenile justice system; and

the cause in this context is neuroscientific knowledge. The focus was therefore on 'causes-of-effects' (Bennett and Elman 2006: 457).

6 Reliability and validity

According to Rubin and Rubin, qualitative studies are assessed by transparency, consistency-coherence and communicability (2002). The question of reliability of social research projects is difficult to define, particularly if the underlying assumptions are based on a constructionist perspective of the world. For this project, in order to investigate the cases and establish internal validity, the research process was guided by the following questions:

- Was the sample design/selection without bias, 'symbolically' representative of the target population? …
- Was the fieldwork carried out consistently? …
- Was the analysis carried out systemically and comprehensively? […]
- Is the interpretation well supported by the evidence?
- Did the design/conduct allow equal opportunity for all perspectives to be identified?

(Ritchie and Lewis 2003: 272)

Additionally, it is argued, that due to the integrated reflexive approach in respect of sampling, data collection and the analysis process, reliability and transparency was achieved (Ritchie and Lewis 2003). Validity was achieved through clear description and documentation (external and internal validation) and a transparent process which was based on 'constant checking and comparison across different sites, times, cases, individuals, etc.' (Ritchie and Lewis 2003: 271).

7 Ethical issues

In general, the research project was undertaken in accordance with the code of practice by the Ethical Committee of the University of Edinburgh. The data collection for this project was dependent on the participation with the interviews process: firstly, access to documents (programmes, policy documents, manuals and tools used in practice) needed to be granted, as well as permission was required to allow the interviewing of practitioners. Some of the sampled councils and institutions had their own internal ethical procedure in respect of research access, which was followed before the interviews took place.

Ethical issues applied particularly to the data collection through interviews. All participants were informed in writing about the study. In order to ensure that all participants were in agreement with the use of the collected data, informed consent was sought from all participants and their line managers: if necessary, also from senior managers in investigated organisations prior to the start of the research process. All participants could withdraw at any time during the research project and the participation was voluntary (Israel and Hay 2006).

All obtained data, including names and positions of interviewees, were stored safely for the required period of time and were destroyed appropriately. In cases when an interview was recorded, the participant gave specific consent.

The identity of participants and of organisations was protected, and names of organisations and interviewees were not given. Interview data were anonymised prior to archiving (Ritchie and Lewis 2003).

It was also important to pay attention to personal opinions raised during the

interviews. These could, for example, be opinions about processes within the organisation that might be difficult or not appropriate to be shared with other members of the institution through the process of research.

Further attention needed to be paid to the ethics of the combination of biology and criminology/youth crime, as any links to eugenics and biological determinism need to be avoided. This was achieved by the careful examination of findings. Although neuroscience can add valuable insight into human behaviour, it is acknowledged that some neuroscience researchers view 'the condition of criminality (or antisociality) [to be], if not literally a disease, then at least an abnormality or deviation of some sort from biological health and normality' (Hacking 1995). However, this did not appear to be a problem during this research process.

8 Conclusion

As described, the findings presented over the next few chapters are the result of a study in different local authorities across Scotland. In order to answer the research question of how neuroscientific research findings influence juvenile justice practice, a case study approach was employed. The qualitative data collection for this explorative and investigative research involved interviews with practitioners, team and service managers, and training providers in different settings within the juvenile justice system. Additionally, two focus groups with practitioners and forensic psychologists were undertaken. This was combined with a small-scale analysis of specific neuroscientific publications. The data were analysed by methods including coding, theoretical saturation and constant comparison (Bryman 2012, Charmaz 2006). Additionally, a sample of scientific publications was analysed by Foucauldian discourse analysis (Willig 2008).

The second part of this dissertation focuses on the research findings and the conclusions drawn from this. The first chapter concentrates on the conceptualisation of 'aggressive behaviour' by practitioners, training providers and neuroscientific research publications.

6 Aggressive Behaviour in Different Social Worlds

1 Introduction

This chapter examines how juvenile justice practitioners and training providers in Scotland and neuroscientific publications conceptualise aggressive behaviour. The reflections from different interviews with practitioners and training providers shows that aggressive behaviour is seen in the context of the current legislation and the service user's life history, and is conceptualised in a developmentally informed approach. It is shown that practitioners refer to their experiences and observations when discussing aggressive behaviour. It is argued that this is in contrast to training providers, particularly forensic psychologists, as they seem to conceptualise this behaviour mainly in the context of psychological theories. Publications in the field of neuroscience predominantly make reference to disorders and theoretical psychological concepts. The chapter establishes that none of the distinct social worlds has an agreed definition or concept of 'aggressive behaviour'. The chapter also discusses the difference between risk assessment and classification tools used in juvenile justice practice as opposed to neuroscientific research, whereby it becomes clear that the term 'aggressive behaviour' shares certain similar components in the three social worlds. However, the existence of a clear definition of aggressive behaviour cannot be determined. Therefore, it is argued that aggressive behaviour is

seen in distinct, different ways and can be established as a boundary object in Griesemer's sense.

2 An approach to 'aggressive behaviour'

'Aggression' as a term comes from the latin word *aggressio* and means attack. Although this etymological translation seems simple, the terms 'aggressive and violent behaviour' are used for very complex and complicated forms of behaviour and emotions, and their definition depends on various different factors. There is not one single definition or theory for aggressive behaviour in the literature and, depending on the context and culture, aggression has different meanings (Cairns 1996; Connor 2004; Tolan 2007; Wahl 2009). The same applies to violence. The boundaries between antisocial and violent behaviour are somewhat blurry and, as a consequence, the two terms are often used interchangeably. There are various theories and concepts about aggressive behaviour; for example, from sociology, psychology, criminology, philosophy and anthropology. Theories and concepts of aggressive behaviour are relevant in different disciplines in practice, as, for example, juvenile justice, psychiatry, psychology and education. In order to comprehend the knowledge translation process in the context of this PhD, we first need to understand how juvenile justice practitioners and training providers in the field conceptualise aggressive behaviour and how this terminology is used and understood in neuroscientific publications. The conceptualisation helps to see the links and similarities as well as the differences of how aggressive behaviour is viewed and understood. This then in turn allows statements about the complex process of how theoretical knowledge from a distinctly different discipline like neuroscience reaches the (tacit) knowledge pool of juvenile justice practitioners. The following paragraph looks at different concepts of aggression as they are found in

the theoretical literature. This very brief overview does not claim to be complete or sufficient; it rather serves the purpose of establishing how complex the term of 'aggressive behaviour' is.

It is argued, that the concepts of aggression can be grouped as follows:

Concepts of aggression

- Concepts from different disciplines (for example, the different psychological and psychiatric concepts, risk assessments in criminal and juvenile justice systems);
- Concepts of different forms of aggressive behaviour (for example, instrumental and impulsive, covert and overt, reactive and proactive behaviour, externalising and internalising of behaviour, predatory and affective aggression);
- Age- and persistence-related concepts (Moffitt 2003)

This grouping shows a very limited attempt to cluster the different concepts and highlights that there is no consistent concept of aggression or violence. The concept in use depends on various factors: the purpose of assessment; the profession of the assessor; and if it is a concept in use for a specific behaviour; or if it is a concept in use to explain a general trend. Probably the most common conceptualisation of aggressive behaviour is based on two distinctions: instrumental and affective (or emotional) aggression (Berkowitz 1993). Elbert and Weierstall use the terminology of appetitive aggression:

> But the controlled- instrumental (appetitive) aggression is planned, target-oriented and that is what we presume- motivated out of itself from hunt and power: it is the aggression of the considerate aggressor, the hunter, the one in power and it is the form of aggression hitherto seldom scientifically examined. (Elbert and Weierstall 2010: 103)

Here, the distinction is based on the motivation for the aggressive act, whereby aggressive behaviour can be driven either with a purpose to gain some form of benefit or due to uncontrolled emotions. In the context of uncontrolled emotions, aggressive behaviour can be either a reaction to a perceived provocation or threat, or due to frustration in the form of reactive aggression (Wahl 2009). Here, also aggression as a form of fear regulation can be observed particularly with young people. Petermann argues that in this context, aggressive behaviour is used to instil respect in other people and therefore reduces fear. This can result in a cycle of reinforcement (2000). It is here argued that there is a difference in the way external stimuli are perceived and interpreted due to social-cognitive information processing (2000).

Tolan states that across the literature, four distinct types of violent behaviour can be found: situational, relationship, predatory and pathological violence (2007). Tolan admits that the suggested different types are currently only theoretical distinctions as there is no evidence for their practical application yet. Here, they are used solely for explanatory purposes. Situational violence or aggression depends on circumstances and is usually unplanned (for example, violence and aggression at pubs on a Saturday night). Relationship violence occurs, for example, between peers, family members or between spouses. Predatory violence includes robbery, mugging or gang violence and 'is perpetrated intentionally to obtain some gain or as part of a pattern of criminal or antisocial behaviour' (Tolan 2007: 14). Pathological violence might have underlying biological reasons, for example, neural trauma. We can see here that aggressive behaviour and violent behaviour are sometimes used interchangeably and a clear distinction is difficult to make. However: 'There is less certainty, as well as a substantial disagreement, about how fully intentional the expression to cause physical harm must be for the act to be considered violent' (Tolan 2007: 6).

As aggressive behaviour is often seen in the context of the situation, Cairns (1996) has developed a model of interaction between two individuals and their environment. This model includes several levels on the side of the individuals as well as environments that influence aggressive behaviour and creates an image that displays the complexity of this term:

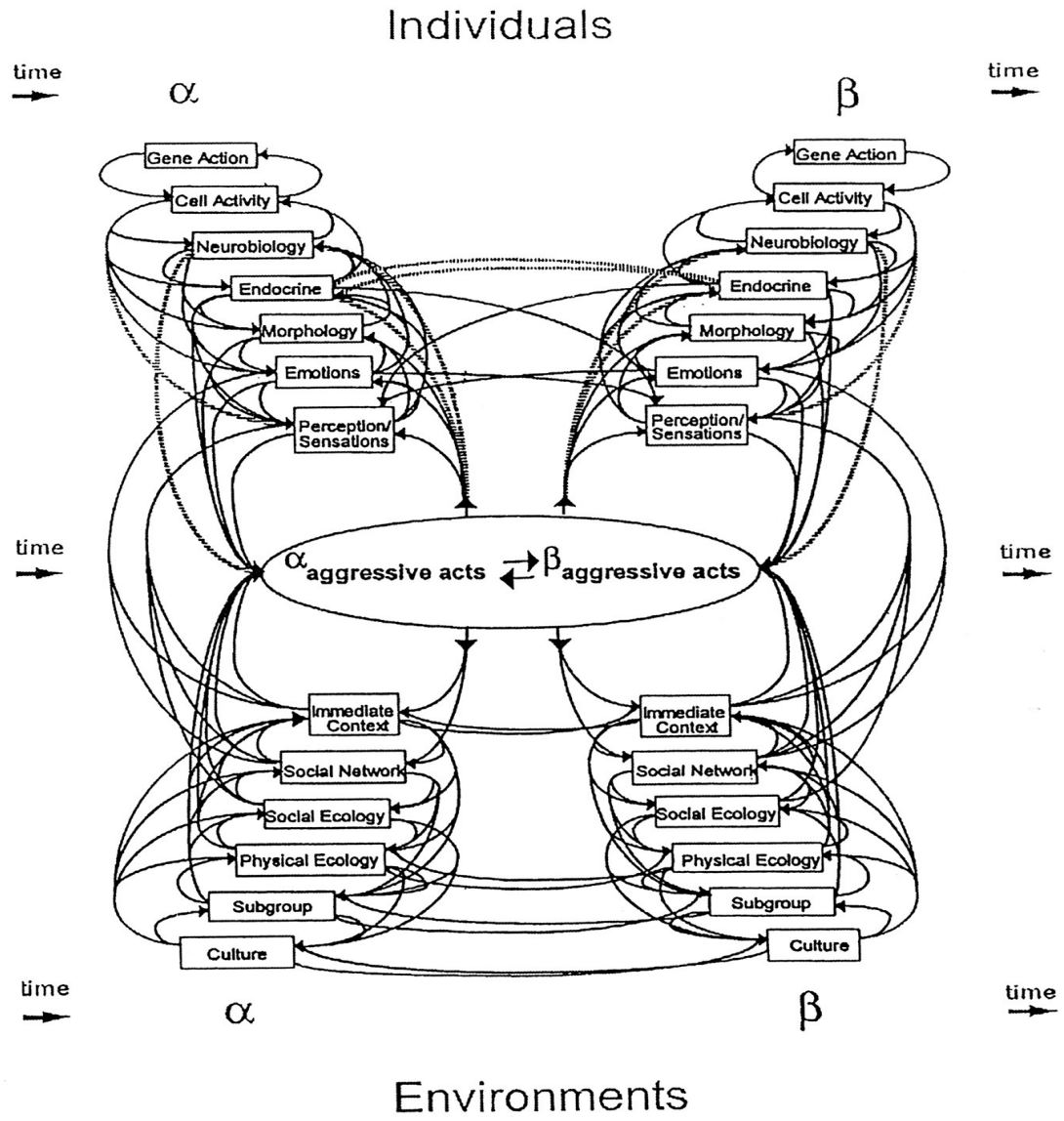

Image 6: Model displaying the interacting relationships of two individuals and their environments in the context of an aggressive act (Cairns 1996: 50)

Aggression can also be investigated from a developmental perspective. This leads to the theoretical distinction between early-onset and adolescent-onset of aggression (or delinquency and criminal behaviour) (Loeber and Hay 1994; Frick and Ellis 1999; Moffitt 1993; Frick 2000). The two groups are reported to have significantly different outcomes in their development: childhood onset behaviour and conduct problems seem to continue their aggressive and criminal behaviour into adulthood, whereas adolescent-onset behaviour problems often result in a short period of behavioural problems which ends at the beginning of adulthood (Moffitt 1993).

Younger children usually display oppositional and defiant behaviours up to school age; due to the increased bodily strength, aggressive behaviour is more severe and serious during adolescence and early adulthood (Petermann and Petermann 2000). This behaviour changes during adolescence to more delinquent and severe behaviours. Additionally, there is a difference in the way girls and boys display aggressive behaviours. In general, boys tend to show more direct and instrumental aggression where physical strength plays a role. In contrast, girls tend to display more indirect and emotional aggression: Petermann and Petermann (2000) stated that babies already display aggressive behaviour; however, the differences between the genders are not significant yet. Nonetheless, there is a difference observable in the way emotions are regulated, whereby boys tend to be less stable (Petermann and Petermann 2000). Additionally, it is argued that girls tend to show more positive emotions and are better able to regulate their emotions (Loeber and Hay 1999). The difference might be explained due to different maturation processes as well as different education and social expectations in respect of social abilities, which influence the way conflicts are resolved. Therefore the interaction with, and the expectations of, the environment play a crucial role in the development of aggressive behaviour (Petermann and Petermann 2000). Loeber and Hay (1994) differentiate four groups of young people: young people who abstain from aggression; those whose aggression is stable and the severity of which does not

change; young people whose severity of aggressive behaviour increases over time and eventually results in violence; and the group of young people whose aggressive behaviour remains at a stable level.

Aggression also needs to be differentiated from other forms of, sometimes similar, behaviours or emotions such as, for example, anger. However, the distinction between anger and aggression is not easily made: Potegal and Stemmler (2010) argue that: 'It is certainly possible to be aggressive without being angry; this is aggression in its 'proactive' form (Hubbard and Smithmyer 2002). Conversely, anger without overt aggression is the norm in many cultures' (2010: 4).

Wahl (2009) summarises and simplifies the different concepts of aggression based on (Genreau 2005) and Cairns (1979) as follows:

> Precursor:
> - Initiating context (specific circumstances or no external initiator)
> - Neurobiological mechanism (neocortical or subcortical)
> - Development (specific developmental progress within or without the norm)
>
> Appearances:
> - Specific behaviours (direct or indirect)
>
> Consequences:
> - Consequences for others (physical or mental injury)
> - Consequences for the actor (long-term social gratification or immediate emotional reward).
>
> (Wahl 2009: 7)[16]

This summary of the different concepts or forms of aggression presents different categories but only achieves an approximation of the term.[17] A criticism of the

[16] Translated by the writer.

[17] The perspective of juveniles on aggression or aggressive behaviour is not discussed here as this is outwith the scope of this thesis. Please see, for example, Lombard (2011).

portrayed summaries can be made, as they do not include aggressive acts in the form of self-harm. However, it is, so far, not established if this is a different phenomenon of aggressive behaviour, which usually is understood as being directed against someone or something else (Connor 2004). However, concepts or summaries will probably never be satisfactory for all scientists or practitioners involved; Gendreau and Archer (2005: 25) give examples of critics of the definition of aggression as a 'diffuse meaning and a consensus is not necessary to perform meticulous analysis of aggression' (Cairns 1996), and 'aggression is an inadequate concept that ought to be replaced by more precise terminology' (Felson and Tedeschi 1993). Connor argues, that: 'Clear definitions of aggression are important. Definitional confusion and vagueness hamper research, confuse public policy debate, confound treatment, and can harm individuals' (2004: 24).

It can be concluded, that the stability of aggressive behaviour can be assessed through the age from when the behaviour started to develop, the frequency of the behaviour, in how many areas of life (school, home, peers and so forth) this behaviour can be observed and the different forms of aggressive behaviour (Petermann and Petermann 2000).

3 The different social worlds of the knowledge translation and exchange process

The different disciplines in the context of researching, publishing or working with juveniles displaying aggressive behaviour can be called 'social worlds' (Gieryn 1995; Strauss 1978). For this study, three distinct, but overlapping, social worlds can be identified: juvenile justice practice, training provision and neuroscience. In each group, members share the activity of either working with young people on their

aggressive behaviour (juvenile justice practitioners), or teaching staff about aggressive behaviour (training providers) or researching what happens when someone is aggressive on a neuroscientific level (neuroscientists).

The different social worlds use various classification systems and tools whereby each classification system has a different approach to diagnose or label (aggressive) behaviour. Classification and labelling in this context are important, as it differentiates normal aggressive behaviour from behaviour that is decided to be not acceptable in our society today. This, in turn allows treatment as well as research in a more standardised form. The language developed and used with classification methods therefore focuses on problematic behaviour and disorders. Classification systems are always a result of negotiations, compromises and trade-offs and are continuously evolving and changing (Star 1989). The classification of aggressive behaviour depends on the cultural context as well as on the diagnosing practitioner. This influences how researchers and practitioners view or use the term 'aggressive behaviour'. Here, the classification of aggression depends on the different 'tools' used or: 'each classification system is tied to a particular set of coding practices: and because classification systems in general … reflect the conflicting, contradictory motives of the socio-technical situations that gave rise to them' (Bowker and Star 2000: 12).

In order to establish the construction of aggression by juvenile justice practitioners, training providers and in neuroscientific research publications, the following paragraph establishes the different social worlds. This is then followed by an investigation of the most noticeable and important concepts of aggressive behaviour the different interviewees have reflected on. The prominent concepts of aggressive behaviour, which are used in the neuroscientific literature, are then discussed. The differences between the conceptualisation are be highlighted and it is concluded

that aggressive behaviour is functioning as a boundary object between the different social worlds (Bowker and Star 2000).

3.1 The social world of practitioners in juvenile justice practice in Scotland

The set-up of juvenile justice teams within Scottish councils depends on the individual organisation: occasionally forensic psychologists are employed by a local authority within a specialist service, from time to time forensic psychologists are used as external consultants, sometimes child and adolescent mental health services (CAMHS) specialists are part of the team, occasionally the team includes clinical psychologists and sometimes, juvenile justice teams only consist of social workers and social work assistants. Similarly, secure units are organised differently and the services of forensic psychologists and clinical psychologists are used differently. The heterogeneous organisation of the different local authorities and services, however, does not necessarily play a role in the way the examined knowledge is transferred.

Practitioners in juvenile justice in Scotland have different roles and different backgrounds. The interviewed practitioners work in juvenile justice teams in local authorities as social workers, senior social workers, psychologists, mental health nurses and team managers. Other interviewed practitioners work in secure units as care workers or as programme providers, who have a background in psychology, social work or are trained to SVQ levels.[18] It has to be said, that one of the interviewed practitioners stated that part of her role is to provide knowledge to her colleagues in the team due to her background in mental health. However, it is also expected that team managers and senior practitioners give guidance and support, and it is therefore justified to include her in this group.

[18] SVQ stands for 'Scottish Vocational Qualification' awarded by the Scottish Qualifications Authority (http://www.sqa.org.uk).

3.1.1 The use of classification and assessment tools by juvenile justice practitioners

McAra states that 'A core task of social work is now to provide risk assessments for all hearing referrals, using standardised risk assessment tools (Scottish Executive, 2002a)' (McAra 2006: 134). In juvenile justice practice, the majority of the interviewees mentioned the following risk assessment tools: SAVRY (Structured Assessment of Violence Risk in Youth) for violence, Novaco Anger Scale for anger, AIMS I and II (Assessment, Intervention and Moving on) for sexually harmful behaviour and ASSET/YLS-CMI, as a more generic risk assessment tool. The purpose of risk assessments is to better comprehend the kind of behaviour that is seen, and they are also used to judge risk to other people as well as the person him- or herself[19] (see Appendix 5).

SAVRY is specifically designed for violent adolescents. This assessment tool is used to provide a basis for the allocation of appropriate intervention methods. It is:

> composed of 24 items in three risk domains (Historical Risk Factors, Social/Contextual Risk Factors, and Individual/Clinical Factors), drawn from existing research and the professional literature on adolescent development as well as on violence and aggression in youth. Each risk item has a three-level rating structure with specific rating guidelines (*Low, Moderate,* or *High*). In addition to the 24 risk factors, the SAVRY also includes six Protective Factor items that are rated as either *Present* or *Absent.* (Borum and Bartel 2003: 239)

The 'AIM' assessment tool (Print et al. 2004), which is used for children and adolescents, who display sexually harmful behaviour:

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[19] Please refer to, for example, Dagleish 2003; Munro 2004; Webb 2006, for discussions about risk and risk assessments in social work practice.

> provides guidance for a wide range of practitioners including children, youth justice and criminal justice social workers, police, education, and health professionals, and provides a common language and a shared approach to tackling sexually harmful behaviour. (Hutton and Whyte 2006: 9)

Additionally, the cycle of aggression (Kaplan and Wheeler 1983) is used, which distinguishes a phase of trigger, escalation, crisis, post-crisis or depression and recovery phase and a baseline-behaviour that can be observed during acts of aggressive behaviours. This model is particularly useful for practitioners working directly with aggressive juveniles.

Although some practitioners were aware of the classifications of the DSM and the ICD, none of the practitioners used terms like 'conduct disorder' or 'oppositional defiant disorder' or similar in their reflections about aggressive behaviour. During the interview process, practitioners regularly made statements about the use of assessment tools and classification of aggressive behaviour. One exerpt of an interview with a practitioner captures these statements very well:

Interviewer*:*

> Do you actually use the diagnosis of conduct disorder or anti-social behaviour disorder?

Practitioner 4:

> No, I found it really unhelpful. I mean, conduct disorder and opposite defiant disorder is another one that paediatricians often use and I am not quite sure. I mean I looked it up and … when we were trained as psychologists, we were taught to use that in our case studies and things. But I think it is quite unhelpful.

Interviewer*:*

> Because it is not practical?

Practitioner 4:

> Yeah, they all do have that and you know that anyway and when they are challenged with anti-social behaviour or with whatever they have done. Conduct disorder, no, I find it really unhelpful, because parents then might

> think 'oh well, there is not a lot I can do about it, they have a disorder, and they were born with it and it is not my fault'.

This quotation clearly shows that in juvenile justice, practitioners rarely find the concept of a 'disorder' for aggressive behaviour useful. This might therefore explain why none of the practitioners referred to this terminology and this specific classification approach, which is, for example, used by psychiatrists or some neuroscientific publications.[20]

3.1.2 The conceptualisation of aggressive behaviour by juvenile justice practitioners

The different practitioners within juvenile justice teams and secure units commented on aggressive behaviour from different viewpoints. Examples here are; the perspectives of report writing and assessment, de-escalating situations in the office or secure units, planning or undertaking programmes, and working with the young person on their issues. There usually is a focus on the offending behaviour in general, but not necessarily on the aggressive behaviour in particular, when practitioners work with the young people. However, there is an agreement between the interviewees that many of the young people they work with display some form of aggressive behaviour:

> I would say that working in the juvenile justice team, the young people are more likely to display signs of aggressive behaviour than say you would [if you] take a general selection of young people and they are at mainstream school.
> (Practitioner 3)

Police charges usually stand as the entry point for receiving access to services within the juvenile justice system. The categories of police charges of violent offences in

[20] Please see below for more details.

Scotland are differentiated in minor assault, assault, serious assault, assault with intent, assault with disfigurement, attempt murder, murder, reckless behaviour, robbery, threats, extortion and vandalism (CJSW 2011). Aggressive and violent acts of a sexual nature are not included here. This list of aggressive behaviour distinguishes between levels of physical aggression, but also includes acts of aggression that are more difficult to differentiate and are summarised in a form of 'breach of the peace'. Breach of the peace could be any threatening act, which results in a negative emotional response on the side of the victim:

> You would start with things like breach of the peace which can be quite a low level offence in which somebody would put people in a state of fear, so that encompasses anything from swearing to potentially use of violence.
> (Practitioner 1)

This quote already highlights that aggressive behaviour is not easily defined within practice and that various different factors need to be considered in order to answer a question relating to its definition. The difficulties in defining aggressive behaviour can also be seen in the fact that there are different terminologies used to describe this behaviour. Another terminology that is important to mention in this context would be 'antisocial behaviour':

Interviewer:
> So in your differentiation, what about anti-social behaviour?

Practitioner 2:
> For me that would be very low level, obviously the start of the possibility of developing into something more and then you have to look at the types of antisocial behaviour they are doing. So antisocial behaviour could be anything from graffiti to setting fire to a wheelie bin, to throwing stones at a car. So if you've got a combination and we were just talking about a young person who is classed as antisocial behaviour, he has been involved in a lot of antisocial behaviour, the whole spectrum, that including animals, being harmful to animals. So he worries in the fact of the prosecution of where he is going with that, ok.

Interviewer:

> So, you would say that this is antisocial behaviour rather than aggression?

Practitioner 2:

> No, I think it gets labelled, the behaviour as antisocial behaviour, the act of being aggressive. And that, I think you have to look at the behaviour and the act within that.

This practitioner was clear that in her opinion, there is a differentiation between the specific behaviour and the specific act in the way this terminology is used. However, there are no clear definitions or boundaries between aggressive behaviour and antisocial behaviour used in practice.

> There are all sorts of factors actually that count as antisocial behaviour: vandalism, theft, breach of the peace, binge drinking that type of stuff. I think once you get into that violent side of things the stakes are much higher I suppose, and that is when you are starting to have your, do your risk assessments and it all goes up a notch and everyone becomes a lot more concerned.
> (Practitioner 3)

Although the boundaries between breach of the peace, antisocial behaviour and aggression and violence seem to be blurry in theory, in practice, this statement shows that as soon as there is an element of violence, the scenario changes and more serious measures are put in place. Here, they would include additional risk assessments and an increased monitoring of the situation, which possibly results in further decision making.

Practitioners often mentioned the importance of incorporating the perspective of the victim when defining aggressive behaviour:

> I think that there is an element of the beholder about what is aggression and what is not. There is something people would agree would be aggression, but there can be definitive something that only the individuals can then say how

> threatened they felt or what emotional response they got from someone who was aggressive and where that kind of power imbalance might lie. So that is slightly more difficult.
> (Practitioner 1)

In order to conceptualise aggressive behaviour, it is therefore also important to include the effect this behaviour might have on the victim. So, the resulting harm needs to be considered, too. Consequently, this then usually plays a role in the assessment process and, therefore, for the recommended consequences and interventions. One practitioner described aggressive behaviour as follows:

> I suppose, aggressive behaviour, when I think about aggression, it is not necessarily an act of violence where somebody actually physically assaults you, but I suppose you can be emotionally aggressive, anything that actually hurts someone else, emotionally or physically. I would count that as aggression, or even if it does not hurt, I think you can be aggressive too in your manner without actually impacting on someone else if this does make sense.
> (Practitioner 3)

So this means that without taking into consideration what this behaviour has done to the victim, it is even more difficult to define it in practice. However, aggressive behaviour as well as antisocial behaviour can also be directed against property or animals, for example, in the form of vandalism:

> I think that vandalism could be an aggressive act I suppose, but more often than not it tends to be perpetrated, caused by, several kinds of vandalism and they never have contact with our service again or somebody has a tag. He will tag 20 or 30 places across the city: more about reputation than about aggression.
> (Practitioner 1)

This quote shows that although some acts of vandalism can be classified as aggressive acts, an aggressive act does not necessarily mean that this behaviour is motivated by aggression. Therefore, in order to define aggressive behaviour, the

motivators of this behaviour need to be taken into consideration. One practitioner stated the following:

Practitioner 2:

> So I think it is a far more complex kind of concept and word than people actually give it justice for, and it is used far too often without actually thinking about what it means. And I think that young people are getting labelled as being angry far too often without actually having an understanding where the behaviour or the underlying reason is coming from.

Interviewer:

> So why do you think that is then?

Practitioner 2:

> Because people only see the behaviour, they do not look behind that.

Interviewer:

> And why not?

Practitioner 2:

> Maybe lack of understanding, maybe it is easier to do an action or behaviour than rather actually understand what is going on for the young person. I think, I hope, the staff here have a much better understanding that there is something underlying and then they refer them to me.

In the common understanding of aggression, aggressive behaviour is often differentiated into anger, aggression, violence and rage. In order to get a better understanding of the definitions and concepts practitioners use, this terminology was employed as a probe for reflection during the interviews:

Interviewer:

> So do you differentiate between aggression-rage-anger-violence?

Practitioner 3:

> I suppose, probably. For example, you might think that when somebody is aggressive you might be able to tell by their tone of voice, or the way they are gesturing or when they are slamming something, or so, so I suppose

you can call that aggressive but I would not call that violence. Violence I would see as actually physically disturbing something or someone. Rage, I would see as going beyond violence, where someone is going to a state where you are not able to control your actions. Whereas, I suppose you can control violent actions but you cannot control rage as easily.

Interviewer:

And anger?

Practitioner 3:

Anger, I would see as something that is a feeling. Aggression, I do not know if you could feel that. You would distinguish aggression but you would see it by how someone behaves. But anger, somebody could be angry without you seeing it. So anger is a feeling.

The majority of the practitioners, however, did not feel confident with these theoretical differentiations:

Interviewer:

Do you use the words anger-aggression-violence interchangeably?

Practitioner 1:

I do not think that they are clearly defined. So if someone struggles to control their anger, they will on occasion behave in an aggressive fashion. Likewise, someone will behave violenty. I see those terms pretty interchangeably, yes.

Interviewer:

So, if someone is aggressive, can he then have an anger problem as well and does that work the other way around as well?

Practitioner 1:

Somebody says you are being aggressive, so let's take someone who perpetrates an assault; the context again of the assault will be yes. I imagine you could be aggressive without being angry in the sense of you maybe wanting to acquire money for drugs and therefore robbing somebody of their iPod would be a way of doing that. But I would struggle, in order to hand over somebody the iPod this would need to be in a threatening fashion to the extent that if the victim of that offence would be asked was that person aggressive, you would say yes, however, that person may have been presenting as angry.

There is awareness, that anger can be also a positive driver of behaviour and does not necessarily need to result in violence. It is obvious that the differentiation into behaviour and feelings seems to be very prominent in the practitioner's differentiations of aggressive behaviour. This can also be seen in the following quote:

Practitioner 3:

> I think there are levels of aggressive behaviour, for me it gets kind of segregated into different levels of aggressive behaviour, obviously high end. And that I suppose are you talking about anger or are you talking about aggression?

Interviewer:

> You obviously differentiate those.

Practitioner 3:

> Yeah, I also do the Novaco Anger Scale, and I do it for the staff here as well. So I have a much better understanding I suppose why the anger is split up. So yes, there is a differentiation between anger and aggression. Because if someone is aggressive, this does not mean that there are anger issues. It is quite complex. How do I differentiate it? I suppose I will always recommend that they do the anger scale and relate it back rather than just make a subjective opinion. I think I'd rather do that than actually just say that.

Interviewer:

> So do you differentiate rage then as well?

Practitioner 3:

> Yeah, I put rage more into an outburst rather than an aggressive action. This does not have to be underpinned by anger.

Interviewer:

> So what about violence, where does that come in?

Practitioner 3:

> Yeah, this now gets really complicated. I suppose again, violence, I mean there is a working definition from the Scottish Government that we have and that is what we kind of use as a baseline. I suppose when you think

about it yourself, you know, what is violent? Then you have a concept of what the action is.

These statements also underpin how important assessment tools are for practitioners to differentiate the different forms of aggressive behaviour in practice. Additionally, it also shows that personal experience also plays a role in the way behaviour is assessed and conceptualised. It also highlights how helpful practitioners view an agreed and workable definition of the different forms of behaviours, like the proposed definition of violence. The other important point in this quotation is the impact experience has on the assessment of aggressive behaviour. In this context, it means particularly the experience of witnessing young people being aggressive (for example, towards their parents during working meeting with the practitioner or towards peers in a secure unit). However, it also includes aggressive behaviour, which is directed towards the staff members directly.

Similar views on this can be seen in the quotation from the focus group where it becomes clear, that in practice, professionals are influenced by different theories as well as their own experience:

(Focus Group, Programme Worker, Secure Unit)

Interviewer:

So what is aggression and violence for you then?

Programme Worker 3:

So you mean the theory of what is aggression and violence as opposed to what we actually see in terms of behavioural aggression and violence? I think you would pretty much go through this process of anger being the emotion, aggression being aspects of attitude and violence would be towards the behaviours if you like. I know that this has an overlap with physical aggression as well.

Programme Worker 1:

> Yeah, that is pretty much what I was going to say. I think you if you look at it from the programme delivery, this is the sort of route we would go down then. Anger is the underlying feeling and aggression is the physical and verbal expression of that anger. And inappropriate expression of that and taking it to the really extreme violence and stuff. That is kind of how we look at it. How we see it on campus is in many different ways.

Interviewer:

> That is interesting, why?

Programme Worker 1:

> Why? Well, you can see subtle forms of aggression, like controlling behaviour, manipulations and things like that. Things that people would not necessarily pinpoint as aggressive behaviour but you know it is coming from that sort of angry place with that emotion behind it. If that makes sense.

Interviewer:

> Absolutely. That is interesting. You actually have a kind of wider view of aggression than the theory would give you?

Programme Worker 1:

> Yeah. I think that is probably, I think that is partly best, to have the theory and what we see and to prevent things from escalating withour experiences we have every day.

3.1.3 Aggressive behaviour as a health and safety issue for staff

Only about half of the interviewed practitioners felt that aggression directed towards them is an important issue, which affects them. Nonetheless, a consultant for aggression and violence has a strong view on this:

> So we are looking at the impact of the behaviour on our staff basically in understanding that this aggressive impact that people are motivated to avoid will reduce the quality of service that we provide. (Training Provider 3)

Staff in secure or residential units are usually trained in de-escalation and restraint techniques in order to deal with situations that could lead to potential harm to other

people within the units. An example here would be the widely used method CALM (Crisis Aggression Limitation Management)[21], which uses de-escalation techniques as well as physical intervention training for practitioners. However, practitioners within local authority teams usually do not participate in these training sessions, as they are not in a position where they should use physical restraints. On the other hand, interviewees stated that they are confident in reading body cues and establishing working relationships with the young person so that they are able to calm young people down before they are attacked. On the other hand, during reflection, some practitioners stated that sometimes they do feel uncomfortable or insecure in how to react to a situation, which involves aggressive behaviour:

> I think if feel confident because like I say there has not been any position that I think … But sometimes I think this is not real confidence is it? Because I think I would feel totally different if I ended up in a situation where I felt vulnerable and I would maybe feel let down or whatever. That I have ended up in a situation and my job has expected me to be in this situation but then on the other hand, maybe I have not been in this position because I can judge quite well when that might happen. It is funny actually, it is quite interesting to talk about this, because actually I have been in situations where I felt threatened, well actually I have been in a number of situations. Well, I would not think that this was a really traumatic incident now that I remember it, but then I think about it, you just take things for granted, I suppose. Even just speaking to somebody in a house where the girl started to kick off with her mum and there was an iron sitting there, and she had a kettle full of boiling water in the other hand. She was doing something with the water she was using to go and wash her … but I remember there was a point when I thought, and there have been other times when I know that I have been near the door purposely, just in case, something kind of kicked off. Just thinking about the Multisystemic Therapy work that I am doing at the moment as well, and because of our on-call service, we are available 24 hours a day, and quite often the phone call is about somebody kicking off, we are not to rush out and deal with that, that is not our role. But I suppose you are using your skills therefore either advising a parent over the phone or making that decision whether they should be phoning the police, or whether you should be phoning the police or Out of

[21] 'CALM programmes are accredited under The British Institute of Learning Disability (BILD) Physical Intervention accreditation scheme, developed on behalf of the UK Departments of Health, Education and Skills' (CALM-Training).

> Hours or whatever. It is quite, it is actually really interesting. No, I do not come across too much violence, and then, yeah.
> (Practitioner 3)

Although most practitioners felt comfortable about their abilities, it also often seemed as if this has never been something they have thought about before. The important point here is that aggressive behaviour for these practitioners is not only something they assess and write about in their reports. This behaviour is something they need to deal with on a regular basis in their personal contact with the service users:

> But the thresholds in my work are certainly different to the threshold in my private life and certainly do accept more aggression in work from the kids than I would do from a friend or family.
> (Team Manager 1)

Most interviewees stated that discussions with colleagues, and during their supervision with their managers, take place in regard to thresholds and how certain acts or aggression are viewed. This informs their assessments, planning for intervention and also has an impact on their own behaviour towards the young person.

3.1.4 The lack of an agreed definition in practice

It became clear during the interviews, that there is a need and willingness to have an agreed terminology or definition for these complex behaviours. It can also be concluded that aggressive behaviour is a very multifaceted term for practitioners; various aspects practitioners experience or assess differentiate its conceptualisation. Practitioners rarely refer to a certain theory or make reference to a specific concept for the explanation of this behaviour. It seems that they mainly draw on legislation or their tacit knowledge developed through theories, experience, risk assessment

tools and structured work – and practitioners clearly state that the boundaries between the different concepts are not always clear-cut.

> I think risk assessments are at the heart of our work, and clearly there is a critique about risk assessment out there about using sorts of scientific tools for non-scientific purposes, but what that reflects against is allowing you to build a picture of a young person. So the tool we use about offending is the Asset re-offending tool, which has 12 categories: education, lifestyle, motivation to change, neighbourhood etc. Although this is only a snapshot, it can give you quite a comprehensive insight into aspects of individuals' lives. Within that, whenever there are concerns about specific issues like violence, there is a specific risk assessment for violence; a structure assessment SAVRY which goes down a few more layers in relation to violent behaviour and things like exposure to domestic violence in infant years, the whole set, the age of violent behaviour. There are more extreme parts like historical concerns about cruelty towards animals, warped patterns of behaviour. The antisocial behaviour we have in place – a pre-referral screening for low level offenders – will have their offences discussed by social work, police and community safety and at that initial discussion there is an opportunity to take minor offences off the table, where then a warning letter will be sent or a home-visit is done by other agencies.
> (Practitioner 1)

This statement shows that practitioners will not only get their knowledge about aggressive behaviours through theoretical definitions and work experience but also through the various differentiated risk assessment tools that are widely in use. As mentioned, there are different risk assessment tools for the different aspects of aggressive behaviour whereyby their role is twofold as one practitioner describes it:

> I think that generally when a young person is being violent or aggressive, there are two parts to it. There is the whole kind of risk assessment, is it keeping everyone safe? I mean, minimising any kind of risk of future violence but there are all sorts of things: why is this young person violent? And you start off with the kind of environment they are in and how they can be supported to lessen their aggression. The other thing I often do is the cognitive assessment, because sometimes I think you can miss something with the young person, whether it is a learning disability – you know, an overall learning disability – or whether it is a deficit in a specific area. Let's say for

> example, a young person, verbally, they seem very switched on and all the rest of it, but they might have real difficulties with non-verbal communication which is hugely important, and we use it all the time, but when the young person is missing the cues, then there is the potential for all sorts of misunderstandings, so if you can kind of get a bit of a handle on why they are struggling then you might be able to lessen their aggression.
> (Practitioner 3)

The quotations suggest that practitioners undertake risk assessments in order to write reports and plan their work. It also seems that risk assessments are useful for a better understanding of the young person in their direct interaction as it helps practitioners to reflect upon the behaviour and the potential reasons for it.

Apart from aggressive behaviour, this statement however may include inappropriate sexual behaviour as well as suicidal thoughts. Risk assessments are used for both Children's Hearing as well as court reports. There seems to be a difference in the way assessments are undertaken, or conclusion and recommendations made for reports for the Children's Hearing System or the Court System:

> Within a hearing report, you focus on the young person, but for a court report you focus on the true version of events. A charge has to be there and empathy and child development is not necessarily important.
> (Practitioner 5)

This point also highlights how the different approaches of the two distinctly different systems influence the conceptualisation of the behaviour in question.

'The National Development (Champion) Group: Working with Children and Young People with Significant Violent Behaviour' in Scotland has developed a definition of violence for the juvenile justice system which was mentioned by various interviewees:

> An act of physical force that is sufficiently severe to cause injury to another person or persons (i.e. cuts, bruises, broken bones, death) regardless of whether injury actually occurs; any forcible act of sexual assault; or threat made with weapon in hand. (Scotland 30 March 2010)

There is, however, no agreed definition for the other forms of aggressive behaviour in practice. The cited theoretical literature at the beginning of this chapter is only sometimes useful and referred to by practitioners: an example for the use of theoretical concepts in practice would be the differentiation of instrumental and affective aggression (Berkowitz 1993) or Novaco's Anger Scale (Novaco 1975, 2003). The Scottish legislation is used in the function of a frame of reference.

In summary, however, the theoretical concepts do not seem to have practical applications. The different assessment tools are used as guidance to capture the different behaviours practitioners see in combination with their own theoretical definitions and practical expertise. It can be concluded that practitioners in juvenile justice teams usually focus on describing aggressive behaviour, for example, in reports, in the context of occurrence and historical developments. This therefore means that aggressive behaviour is conceptualised through a developmentally informed approach. Practitioners do not necessarily differentiate aggressive behaviour in anger, aggression, rage or violence and do not subscribe to a certain theory of aggressive behaviour when they discuss this behaviour. Although theoretical concepts are important, the experience staff members have when they deal with juveniles and their challenging behaviour seems just as important to the understanding of the behaviour they see.

It appears, that in juvenile justice practice, through the reflection, assessment and experience of the practitioners, a conceptualisation for aggressive behaviour of the young people can be generalised: the majority of aggressive acts (no matter which form of aggressive behaviour) is mediated through difficulties in emotional

regulation. Differences can only be seen in gang fighting or certain acts of vandalism.

The described conceptualisation goes beyond definitions from juvenile justice found in the literature, for example, as suggested by Connor (2004). He defines aggressive behaviour from a juvenile justice perspective as focusing on the criminality and delinquency of behaviour in the context of offences. The difference here might be explained through the welfare approach of the Scottish system[22] (for example, by understanding the behaviour from a developmental context, the response is focused on intervention to promote change rather than an intervention to punish).

3.2 The social world of training providers

Training providers have a crucial role in the knowledge translation and exchange process. Training providers are a very heterogeneous group in this field: three of the interviewed training providers have a social work background, two of the training providers have backgrounds in psychology, one in forensic psychology, and one in forensic child and adolescent mental health. The participants of one of the focus groups have backgrounds in forensic psychology. Local authorities or independent service providers employed some of the interviewed training providers; others work independently and provide training and consultancies across different councils. The funding for the training provided stems from government funding, local authority budgets or even charitable contributions.

The interviewed forensic psychologists have two roles; they consult practitioners with some of their casework and deliver training, and some of them work with juvenile offenders in one-to-one settings on certain topics. According to The British

[22] Please refer to Chapter 2 and Chapter 8.

Psychological Society, 'forensic psychologist' is a protected title of a psychologist practitioner who works in the field of applying psychological principles and transferring scientific methods in the civil legal and criminal context.[23]

The following subsection gives a selection of different backgrounds of the heterogeneous group of training providers.

One of the training providers describes his background and interest in aggressive behaviour as follows:

> I am a social worker and have a BSc in Professional Practice of Violence Reduction. I picked up the agenda to violence reduction very soon after starting that post and that agenda developed from training into a sense that the training does not address the issues and we needed to look at this more systematically. My post was reconfigured and realigned and became violence and aggression consultant with a much broader remit than just the training. (Training Provider 4)

Another training provider in a voluntary organisation described her role and background in this manner:

Training Provider 3:

> Well my responsibility within the organisation is to organise the learning and development activities that staff undertake; so some of which we deliver centrally and some of which where I try to support the local managers to deliver themselves. So these are the kind of two different approaches. So that can involve local practice sessions for staff where we look at an aspect of their practice, so what has gone well and what they can improve. It involves training, either me delivering training or getting a colleague to come in and deliver training, or trying to access external training, and it also involves making sure that our staff are appropriately qualified, because staff in this organisation have to meet certain qualification criteria. So part of my job is to make sure we provide qualification opportunities for those staff who need it. And then I would

[23] http://www.dfp.bps.org.uk/

say another aspect of my role is, as we develop new ways of working, I am involved in the development of new ways of working because I would always be thinking about staff's skills and about new learning opportunities and ways of working. And I am also involved in the implementation of it, so trying to help staff, to train staff and help staff to access the training they need in order to deliver these new ways of working.

Interviewer:

So what is your background then?

Training Provider 3:

I have been in learning and development for ten years or so. So for other voluntary sector organisations I had a very similar role and before that I was a researcher and lecturer at [*name*] Uni, so in the area of social justice, so that was a lot about homelessness and social inclusion, and I did a lot of tutoring and lecturing there. So I think from that introduction and learning and development, I really just wanted to get closer to the actual delivery of the service. And so left the kind of academic world to go into a lot more practice-based environment, where you actually are in the service delivery world. […] Still about adult education, and still about learning and development. My degrees are in psychology and policy studies.

One of the independent training providers is an expert on attachment theory and delivers various different training sessions around this topic across the different local authorities and services. Her original educational background was in social work. And yet another training provider describes his role and background in this way:

Interviewer:

You are a Learning Development Officer?

Training Provider 1:

Yes, my official title is Behaviour Management Development Officer. It is a relatively new post within the Children and Families Department and I have a responsibility to roll out training around the management of challenging behaviour. So that is what my specific responsibility is, particularly to sections of the department working with children with social and emotional behavioural problems.

Interviewer:

Do you actually deliver the training yourself?

Training Provider 1:

I have devised the training and deliver it myself, yes. I developed and deliver a two-day behavioural management module to residential care staff and I deliver a shorter version to staff in special schools. […] I use those three documents as kind of my checklists, if you like, for training, but none of them say specifically about brain development, or about attachment or about trauma. And that is the bit that I put in. So it ticks those other boxes in terms of policies, procedures and legislations etc. But it also does a bit more than that because it has got stuff in there about resilience, brain development, trauma and attachment.

Interviewer:

What is your background?

Training Provider 1:

My background is social work. I left uni and started working in residential care and after a few years I came back here to complete my work. It was not a diploma then, it was the CQSW then. […] I left and went back to do residential care again and pretty quickly became a manager. And then was a manager for about 15 years in one or two different children's homes. And in that time became particularly interested in this area, in attachment, in a big way but also in the area of behaviour management and I became an instructor. So when I was a manager I became a CALM instructor and then a post came up to oversee the training for the whole city and I went for it and got it.

What these different quotations show is that the training providers all have a different background but the trainings and consultations they deliver are relevant for this dissertation as they all focus on aggressive or challenging behaviours, attachment theories and/or behaviour management. It has to be said, that the majority of training these providers deliver is not solely set up for, or focused on, juvenile justice practice but delivers training for practitioners across children and families services in general. Excluding one independent forensic psychologist, specialist-training providers for juvenile justice practice in Scotland could not be identified.

3.2.1 The conceptualisation of aggressive behaviour by training providers

(Focus Group, Forensic Psychologists, Secure Unit)

Forensic Psychologist 1:

> So obviously you have all your different definitions and I think the working definition that we use is, aggression would be an attempt to harm maybe physically, or verbally, or mentally or whatever. And that is more stuff that we experience with our kids. I think it is mediated by anger, so I think there is rarely the kind of instrumental aggressive act to get something.

Interviewer:

> So it is more about the regulation?

Forensic Psychologist 1:

> Yeah. It is more the reactive anger regulation stuff. But there obviously is a lot of violence the young people are engaged in, or aggression in terms of gang fighting and all sort of stuff that maybe are not as reactive or mediated by emotions.

Interviewer:

> So you see both sides basically.

Forensic Psychologist 1:

> Definitely in terms of assessment. In terms of here I think it is more anger. But just the wider scope I think.

As established, there are various different concepts and theories of how practitioners can define aggressive behaviour. However, when speaking to training providers, it appeared that there is an interesting differentiation between training providers from a social work background and (forensic) psychologists: forensic psychologists seem to define aggressive behaviour through models based on the theoretical literature. For example, a forensic child and mental health specialist in the context of criminology explains aggressive behaviour as follows:

> There are different categories of crime in that; you have sexual violence, crimes of disorder, crimes of dishonesty, white-collar criminal acts. When you

look at the individual, you would look at the criminogenic risks and the evidence for criminogenic risks so the things we know are directly related to this young person.
(fCAMHS specialist 1)

The majority of the forensic psychologists use a differentiation that is based on the general concepts of instrumental aggression and emotional regulation difficulties, and refer to classification tools like the Child Behaviour Checklist, the DSM, the SAVRY, or other risk assessment tools in use in practice.[24] The use of theoretical concepts seems to be based on factual knowledge gained through training:

I think when you train as a psychologist that is always something you are trained in – to work within your competences. So I don't know. Maybe key areas about assessment and intervention and all that. And obviously the competences are quite vague on the edges, but to start talking like you are an authority on neuroscience would be at risk of going beyond our training. That said, there is obviously lots of it that is well within our competences. So I think it is totally within us to read a paper and critique it scientifically and do some learning for it, but then to become the consultant on that would be too much.
(Forensic Psychologist 1)

In contrast, training providers with a social work background would refer to their own experiences or more general concepts of aggressive behaviour, but very rarely cite a theoretical model.

(Focus Group, Forensic Psychologists, Secure Unit)

Forensic Psychologist 2:

Probably when you look at it in terms of assessment you would probably differentiate between the two and would see the kind of needs he is meeting; the instrumental anger – where that is coming from and you would do recreational. And similarly, with the kind of emotional regulation kind of stuff, it is kind of applied or recommended what kind of

[24] Abbreviations are explained over the next few pages.

coping strategies you can do around that to maybe regulate anger and anxiety management.

Forensic Psychologist 1:

So we do use the kind of formulation model here where you look for the participating and the trigger factors and that kind of stuff, and we would probably assess with the young person and look at the aggression further to look at this formulation. Is it reactional? Is it emotionally driven? Or are there aspects to it which are, you know, not reactive but proactive? And if it would be reactive, we would look at emotional management work and maybe CBT[25] work, and if it is instrumental then probably we would look at more, sort of, attitudes and more pro-social modelling and that kind of stuff.

The interesting point here is that the focus of explaining aggressive behaviour was generally more on emotional regulation and literacy. Aggressive behaviour was rarely explained through instrumental aggression, which suggests that this is not seen as often as affective aggression. Practitioners and training providers only offered an explanation, if at all, on how young people develop instrumental aggression – namely by social modelling.[26] However, emotional regulation or literacy was always explained in the context of historical events in the young person's history and the impac that has on the (brain-) development of the child:

I suppose my way of thinking about it is that it is very often a defensive mechanism in the face of perceived threat or danger – often as a result of a direct experience of threat and danger. So it is the aftermath of direct experiences – so like living in terror. It is like that, incubated in terror kind of idea that is one of the ways of adapting to it. I mean, you can withdraw, shut down or fight back. So a lot of my internal formulation of that is about that. What else? That some children, to survive, the way they make sense of their experiences – I mean even some of the older children, I am thinking about older children. If you have experienced domestic violence, if you have been brought up in an atmosphere of domestic violence, firstly, hormonally you are likely to be stirred up. But also there is the learning from … what do you learn from a situation like that? Some children are identifying with aggression and

[25] Cognitive Behavioural Therapy

[26] Please refer to Bandura 1973; Akers and Krohn 1979; Farrington 1990; Moffitt 1993; Whyte 2009; Feld and Bishop 2011 for details on social modelling/learning theories.

> violence in a parent figure as a lesson about survival. How you live and survive is right or you learn you get the better of people. So there are social learning bits in respect to that as well as the sort of trauma based survival bits of it.
> (Training Provider 4)

The concept of social learning is deeply ingrained in the understanding of the reasons for aggressive behaviour within juvenile justice services, which goes hand in hand with the welfare approach of the Scottish system (Chapter 2). The interviewees have all expressed an obvious concern and interest for the underlying problems of the young people they are working with. Interestingly, although there is a growing literature on empathy[27], only one of the training providers mentioned empathy in more detail:

> And to make a distinction between children who have poor self and emotional regulation, so may sometimes act aggressively under stress , and children who lack empathy and are involved in criminal behaviour and violence. That is what I think, in your juvenile delinquent places or even in prison, you will have people who, in a moment, lashed out and did something, and afterwards are remorseful. It is difficult to be remorseful if you lack empathy, right? Because that is an understanding of the other person's feelings. Then you have another cohort, which is the minority, who will know what they were doing. So there is a pre-meditation in what they were doing. Or even if there wasn't, even after the event, they will still show no remorse after the event. We need to make that distinction otherwise we lump two things together. So one is poor social and emotional regulation, in that they have stress and they have not had good ways in dealing with that. Who are not managing those emotions very well, but then afterwards go, 'oh I did not mean to shout'. And that does not mean they lack empathy; they lack social and emotional regulation. The concern is where people lack empathy and those are the ones that we really need to be watching.
> (Training Provider 2)

[27] Please refer to Haugh and Merry 2001; Decety and Ickes 2009; Szalavitz and Perry 2010.

Here, the link is made between instrumental aggression, emotional regulation and lack or the presence of empathy. Although empathy has not been the focus of the discussions, it is obvious that empathy plays a role during the assessment process as well as during the work that is untertaken with the young people. This can, for example, be seen in the work of an independent programme provider: One of the training providers, for example, described an intervention with a piece of structured work which includes a whole module concentrating on empathy and the role of the victim. Interestingly, however, practitioners and traning providers have rarely discussed psychopathic or callous-unemotional traits during the interviews, considerations, which can be found in neuroscientific publications.

The interviewees were all in agreement that it is a difficult process to work with young people on their behavioural difficulties with all the underlying problems that come with that. There is, however, a strong agreement that the relationship workers can build up with the young person is the key to all the positive changes that can be promoted (Trotter 2006; Whyte 2009). In order to establish good working relationships, knowledge about the young person and his or her difficulties is the fundamental basis. And there are two parts to this: one part is that you need to get to know the person and see how the person reacts:

> There is a general cue, but the emphasis is on, 'you need to get to know this person'. You need to know when they are starting to show signs of maybe going into some kind of cycle. And I talk to people in training about this cycle, … the assault cycle. (Training Provider 1)

The assault cycle mentioned in this quotation is a reference to Kaplan and Wheelers 'Cycle of Assault' (Kaplan and Wheeler 1983). This means that workers need to get to know how a young person interacts and reacts with them and other people; however, they also need to know background history and family history in order to make sense of why the young person reacts the way that they do. In order to undertake a complete assessment in juvenile justice practice, predict risk and plan

an intervention strategy, 'why?' as well as 'how?' questions need to be answered. The consequences of the behaviours did not necessarily play a role in the conceptualisation during the interviews. Nonetheless, due to the fact that the aggressive juveniles are working with juvenile justice practitioners in a youth justice context, the consequences of their actions are part of the assessment and intervention process and therefore cannot be disregarded in practice or training.

In summary, training providers and, here, particularly forensic psychologists, seem to be focused on the use of psychological models like instrumental and reactive aggression and have used theoretical models to strengthen their arguments and their observations. The reference to the literature base was more prominent in the language of training providers than during the reflections of practitioners. In order to describe the reasons for aggressive behaviour, both groups referred to concepts of emotional regulation and literacy and attachment problems, as well as trauma-related developmental difficulties.

It became apparent that there is not a unifying terminology or agreed definition used to explain aggressive behaviour by training providers. The term 'aggressive behaviour' remains, therefore, vague and always depends on the perspective of the person using it. The way aggressive behaviour is described and conceptualised is influenced by experience, the role and the reason for the definition or description of the behaviour.

3.3 The social world of neuroscientific research

The field of neuroscience is highly heterogeneous and its boundaries are not as easily constructed as in other disciplines. The 'Society for Neuroscience' (SfN) defines neuroscience as follows:

> Neuroscience, the study of the nervous system, advances the understanding of human thought, emotion, and behavior. Neuroscientists use tools ranging from computers to special dyes to examine molecules, nerve cells, networks, brain systems, and behavior. From these studies, they learn how the nervous system develops and functions normally and what goes wrong in neurological disorders.[28]

The work of neuroscientists is referred to as research that:

- Describes the human brain and how it functions normally.
- Determines how the nervous system develops, matures and maintains itself through life.
- Finds ways to prevent or cure many devastating neurological and psychiatric disorders.

(Neuroscience 2012)

Neuroscience has developed several 'branches'; for example, cognitive neuroscience and developmental neuroscience, social neuroscience and neuro-informatics – to name just a few. Within this diverse field, different disciplines and professions are incorporated. For instance, research interested in the relationship between hormones and behaviour is undertaken from researchers with diverse backgrounds including psychiatry, neuropsychology, psychology and endocrinology. Bear and Connors (2001) distinguish different levels of neuroscience as follows: molecular, cellular, systems, behavioural and cognitive neuroscience. Behavioural neuroscience is concerned with questions like: 'How do neural systems work together to produce integrated behaviours? … and what is the normal contribution of these systems to the regulation of mood and behaviour?' Cognitive neuroscience is concerned with questions related to the relationship between the brain and the mind (Bear and Connors 2001: 13-14).

There is an extensive amount of publications and research projects in the field of neuroscience on aggressive behaviour (and violence). Neuroscientific research on

[28] http://www.sfn.org

aggression covers several different areas including brain development, brain imaging, psychophysiology, hormones and neurotransmitters, brain plasticity, psychology and rehabilitation. Behavioural as well as cognitive neuroscience studies are influenced by, and based on, findings on the molecular, cellular and system neuroscience. In order to understand the conceptualisation of aggressive behaviour in neuroscientific publications, a decision was made to concentrate on one specific area of research, namely on research about the relationship between cortisol and aggression. This specific area of publications is influenced by the molecular, the cellular and the behavioural neuroscience. The resulting findings are then integrated and used in the context of overarching theories and concepts, which are discussed in more detail over the next chapters.

3.3.1 The use of classification and assessment tools in neuroscientific publications

Neuroscientists use tools like the Diagnostic and Statistic Manual of Mental Disorders DSM (American Psychiatric Association 2013, 2000), the ICD (International Classification of Disease), Child Behaviour Checklist[29] (Achenbach 1991; Achenbach and Howell 1991; Achenbach 2009), Trier Social Stress Task (Kirschbaum and Pirke 1993) and the DISC-Schedule[30], to name just a few to classify and diagnose aggressive behaviour. The methodology of assessment of aggressive behaviour is based on questionnaires with parents, teachers and the participants.

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[29] The Child Behaviour Checklist, developed by Achenbach, is a questionnaire for pre-school children's behaviour and for school-aged children, which differentiates observed behaviours into not true, sometimes true and very true. The questionnaire is either used by parents or teachers or through an interview by an expert. The checklist is widely recognised and focuses on aggression, bullying, hyperactivity, conduct problems, deviance, violence and depression (classified as internalising and externalising of behaviours).

[30] Another used tool is DISC, a psychological tool based on the work by William Marston and developed by John Geier, which classifies people into different personalities. This classification is based on 4 types of people: Dominant, Influential, Steady and Conscientious (Marston 1982).

The DSM (Diagnostic and Statistical Manual of Mental Disorders) (American Psychiatric Association 2000, 2013) is an international classification system used by practitioners and researchers to diagnose mental disorders. There are different versions of the DSM, depending on the year of publication. The actually published manual is the DSM-V. In respect of aggressive behaviour, the DSM differentiates disorders like conduct disorder (CD) and oppositional defiant disorder (ODD) as follows: 'The essential features of CD are persistent patterns of behaviour in which the rights of others and societal norms are violated. […] The essential feature of ODD is a recurrent pattern of negativistic, defiant, disobedient, and hostile behaviour towards authority figures' (Keil and Price 2006: 763). Other important disorders would be antisocial behaviour disorder and psychopathology.

The ICD-10 (World Health Organsiation 1992) differentiates between different disorders relevant for this context as 'personality disorders' (for example, explosive personality disorder) and has been in use in the member states of the WHO (World Health Organisation) since 1994.[31]

The rationale for using classification tools can be explained as follows:

> Classification [is] a means of ordering information and of grouping phenomena not only basic to all forms of scientific enquiry but [it] also is essential as a code for communication between clinicians. It provides a kind of language by which people can describe the disorders they investigate *and* treat, and for this purpose there has to be uniformity in the usage of terms (Rutter and Shaffer 1980: 372).

The language developed and used with the classification methods therefore focuses on problematic behaviour and disorders. The question that arises here is, how can behaviour be classified objectively when the classification methods itself are subjective (Pickersgill 2011) and depend on the cultural context as well as the

[31] http://www.who.int/classifications/icd/en/

diagnosing practitioners? For example, a young male with aggressive behaviour coming from an upper-class background and who is seen by a newly qualified practitioner might probably get a different diagnosis compared with a young male from a housing estate seen by an experienced practitioner, even if their symptoms are similar. However, classification systems are always a result of negotiations, compromises and trade-offs and are continuously evolving and changing (Star 1989). And it can be concluded, that it is very difficult to classify behaviour. The long history and acceptance of classification frameworks like the DSM, DISC or the Child Behaviour Checklist seem to justify their use in this context.

3.3.2 The conceptualisation of aggressive behaviour by neuroscientific research

The different publications on the relationship between cortisol and aggressive behaviour use the overall term 'aggression' or 'aggressive behaviour', which is classified by the above-named tools.

For example, Gordis and Granger (2006) use the Trier Social Stress Test, a Reactive-Proactive Reaction Questionnaire based on 23 items measuring and assessing reactive, retaliatory aggression and proactive, instrumental aggression, and psychopathology as concepts of aggressive behaviour. Aggression is either seen as a disorder or seen in a differentiated description of behaviour based on psychological theories.

Another study from the year 2005 (van Bokhoven and Van Goozen 2005) use the Diagnostic Interview Schedule for Children (DISC-2.25) with participants and parents as well as the Social Behaviour Questionnaire at school (teacher-based assessment) and the behaviour is conceptualised by reactive and proactive aggression.

Conduct disorder (CD), oppositional defiant disorder (ODD) and antisocial behaviour disorder (ASBD)

Publications by, for example, McBurnett and Lahey (1991) use a clinical or a psychiatric assessment and classification systems (mainly DSM) to assess aggressive behaviour and combine this with other techniques like DISC or the Child Behaviour Checklist. As a consequence, conduct disorder (CD); oppositional defiant disorder (ODD) and antisocial behaviour disorder (ASBD) are used as concepts for aggressive behaviour.

Psychiatric diagnosis based on DISC-IV, youth and/or parent reports (Buss-Durkee Hostility Inventory), and pubertal developments measured by the Tanner staging system are the assessment tools for a study on the effects of cortisol on testosterone (Popma and Vermeiren 2007). Here, aggressive behaviour is conceptualised as covert and overt aggression and as various different forms of disorder (for example, conduct disorder and opposition defiant disorder).

Internalising and externalising of behaviour

Other publications, for example, Shirtcliff et al. (2005) and Gordis and Granger (2006) use terminology such as internalising and externalising of behaviour; disruptive behaviour; dysregulated behaviour; reactive, proactive and instrumental aggression; adaptive and maladaptive behaviour; and late-persistent and early-onset aggression; as well as behaviour and emotional problems and therefore refer to psychological concepts.

Another study (Klimes-Dougan and Hastings 2001) investigats cortisol levels in at-risk and normally developing adolescence. The study refers to internalising, externalising and psychopathology as concepts for aggressive behaviour based on

Youth Self-Reports, interviews, and observational and physiological measures, clinical feedback and, in certain cases, the Child Behavioural Checklist, in order to examine the role of emotions in the development of psychopathology.

Callous-unemotional traits and psychopathology

In the context of extending psychopathy to children and adolescence, for Frick et al. (Frick 1998; Barry and Frick 2000), a focus is set on callous-unemotional traits:

> This line of research attempts to identify childhood precursors to psychopathy by focusing specifically on the callous and unemotional (CU) traits (e.g. lack of guilt, absence of empathy, shallow and constricted emotions) that have been hallmarks of conceptualizations of adult psychopathy. (Barry and Frick 2000: 335)

This can be extended to children who display aggressive behaviour with 'callous and unemotional traits, which is analogous to adult conceptualizations of psychopathy' (Frick and Ellis 1999: 149). A study investigating the stability of callous-unemotional traits concludes that the impact of consistent and warm parenting might have a positive effect on the development of children at risk of developing of CU traits: 'Although these results support claims that callous and unemotional features in youth are relatively stable in childhood, it seems evident that these traits are not immutable' (Pardini, Lochman et al. 2007: 330).

We can see that aggression is either seen as a form of disorder based on psychiatric classification systems (for example, CD and ODD) or by using psychological models (for example, externalising and internalising behaviours). Neuroscientific researchers view the term either through the lens of a 'disorder' or in contrast to this, aggression can be viewed through the lens of 'challenging, maladaptive or dysfunctional behaviour' depending on the different used classification tools. The used disorders, as well as the used psychological concepts and models, are not clear

definitions but establish a framework of reference. It can be concluded that there is no consensus on exact forms of behaviour linked to neuroscientific research; the different concepts in use are predominately based on a collection of symptoms or a description of behaviours. However, in some publications, the differentiations of the used concepts are very detailed and are based on biological and medical, as well as psychological concepts to define the behaviour in question.

4 The construction of aggressive behaviour across the different disciplines

So far, this chapter has established that there is no agreed definition on aggressive behaviour in the theoretical literature (Johnson 1972; Cairns 1996; Connor 2004; Tremblay and Hartup 2005), juvenile justice practice, neuroscientific publications or, consequently, by training providers. Here, this means that the different disciplines have their own practice and dialogue in relation to aggressive behaviour. Additionally, the different disciplines have a shared commitment as they all investigate and work with 'aggressive behaviour'. The lack of agreement can partly be explained by the different classification systems used and therefore the different understandings of the different terminologies (Barnes, Bloor et al. 1996: 48). This means that different social worlds use different classification tools and therefore have a different terminology and definition of aggressive behaviour.

However, although all involved professionals, trainers and researchers speak about aggressive behaviour, there is no consensus about what exactly aggression is.

5 Aggressive behaviour – a boundary object?

The 'construction of aggressive behaviour' depends on the discipline and, therefore, the 'lens' used to define aggressive behaviour. As established, the term 'aggressive or violent behaviour' is assessed with different tools and labelled accordingly. All described tools (classification as well as risk assessment tools) are used in order to classify aggression in a differentiated way. However, across the different social worlds there is no consensus on a definition or concept on aggressive behaviour. A fluidity of this term can be seen through the different assessment tools used and therefore across the different disciplines for certain aspects of behaviour. Although there is no clear definition of the different used terms, the general term 'aggressive behaviour' has enough shared components across the disciplines to be classified as a boundary object in Star and Griesemer's sense: 'The creation and management of boundary objects is a key process in developing and maintaining coherence across intersecting social worlds' (Star, 1989: 74). Here, 'neuroscience', 'juvenile justice practice' and 'training providers' are intersecting social worlds. A boundary object is important for 'developing and maintaining coherence' (Star 1989: 393), whereby it is 'weakly structured' in the general use but 'strongly structured' in the individual use by the social worlds (Star 1989: 393). This means that aggressive behaviour has a general meaning across the different involved social worlds, but a distinct and structured meaning across the individual social worlds (for example, conduct disorder – externalising behaviour – vandalism). According to Star, this then allows the boundary object to function in the translation between the different social worlds and promote coherence. The different involved social worlds can recognise the different meanings of aggressive behaviour from the altered perspectives and the knowledge in question can be used and translated from one social world to the other (1989: 412). The concept of boundary objects is particularly important for this study in the context of social work as a transdisciplinary science.

What has been established above is that there is an overlap in the used definitions and assessments, but not an agreed definition in the used methods and disciplines (Image 7).

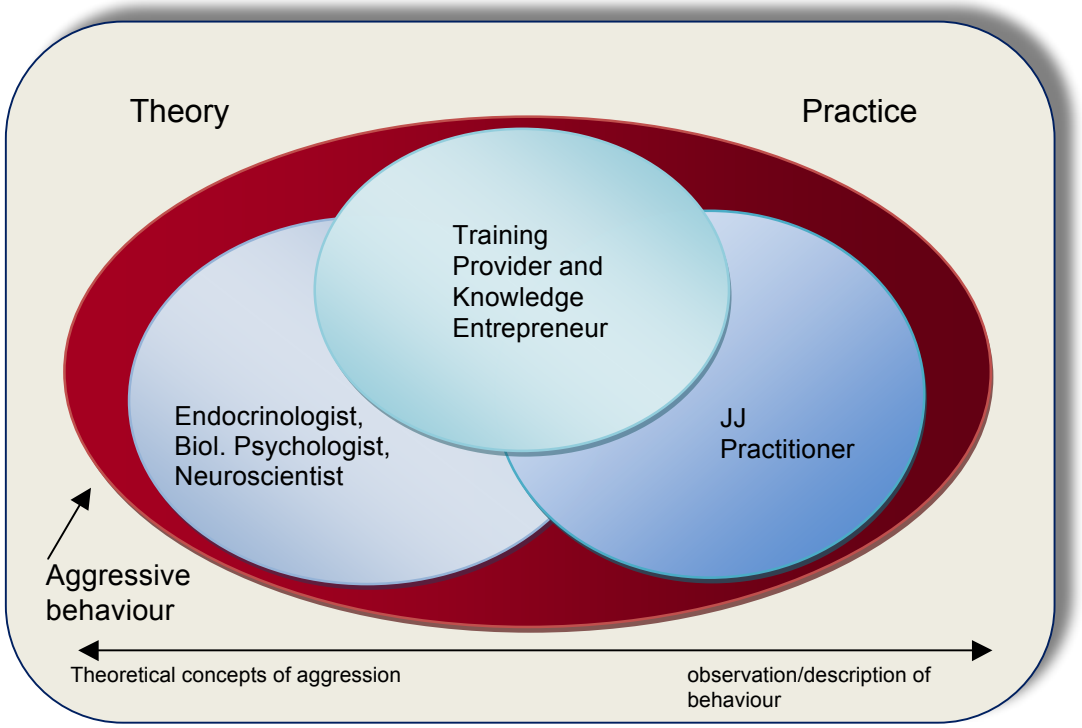

Image 7: Aggressive behaviour as a boundary object

The image above describes the relationship between aggression and the different social worlds' investigation, theorising, diagnosing of, and working with aggression. It further shows that there is a considerable amount of overlap between the concept of aggressive behaviour in neuroscientific publications and juvenile justice practice. This suggests a different emphasis of each profession/field of interest based on its application in theory, diagnosis and practice, which is then reflected in research as well as the knowledge produced and used. Star and Griesemer state that 'boundary objects are both adaptable to different viewpoints and robust enough to maintain identity across them' (1989: 387). This study proposes a different emphasis of each profession or field of interest based on its

application in theory, diagnosis and practice. In practice (for example, psychiatry), concepts of aggression are based on all three different forms: theoretical concepts, disorders, as well as observation and description of behaviour in varying degrees.

In Star and Griesemer's terminology, aggressive behaviour is an 'ideal type': the term 'aggressive behaviour' is a 'description which in fact does not accurately describe the details of any one locality or thing. It is abstracted from all domains, and may be fairly vague' (1989: 74). This means that the different terms used after diagnosis or assessment should be more precise than the general term 'aggressive behaviour'; an example here is conduct disorder. However, the general term allows all researchers and practitioners to work with each other and produce research findings, which are relevant across the disciplines (Fujimura 1992), and it is therefore concluded that 'aggressive behaviour' can be called a boundary-object in Star and Griesemer's sense.

It is likely that in the near future no consensus about the concept of aggressive behaviour in use for research in neuroscience or across the disciplines will be found. The reasons here are simple; aggression and aggressive behaviour are very complex concepts, which cannot be viewed without context. Further, their definition clearly depends on the used perspective and purpose. Cultural as well as moral aspects always play a role in the development and acceptance, as well as the examination, of aggression. Additionally, various different cultures within the field of neuroscientific research have established their necessity and existence and will continue to examine aggressive behaviour with the lens and tools of their profession. On the other hand, practitioners in juvenile justice draw on knowledge from various different disciplines, including neuroscience, and thereby maintain a degree of stability in the definition and concepts about aggression, but change and translate it to suit their purpose of use. The point of knowledge utilisation is investigated further over the following chapters.

6 Conclusion

The chapter has established the three different social worlds involved in the process of knowledge transfer and utilisation: juvenile justice practice, training provision and neuroscientific publications.

In the three different social worlds, the conceptualisation of aggressive behaviour appears to be different. The research data suggests that juvenile justice practitioners establish their knowledge about a service user's aggressive behaviour through their tacit knowledge, their observation and experience, and through specific risk assessment tools. It also became clear that aggressive behaviour is conceptualised in the context of a young person's history and life events. Further, the majority of the acts of aggressive behaviours seen in juvenile justice practice are explained by problems with emotional regulation and literacy, which mostly stem from a traumatic upbringing. Additionally, classifications are often based on legislation, police charges and risk assessment tools. In the social world of practitioners the only agreed definition is on violence.

Training providers, and here specifically forensic psychologists, refer to reference points in the theoretical literature whilst discussing the conceptualisation of aggressive behaviour. Their concepts are based on psychological theories and psychiatric disorders as well as the distinction between emotional regulation, trauma related concepts and, similar to practitioners, conceptualisations based on legislation, risk assessments and police charges.

In neuroscientific research publications, aggressive behaviour is either seen through the lens of a 'disorder' (for example, in the form of conduct disorders) or conceptualised through models from the psychological literature, whereby

assessment tools like the DSM, the Child Behaviour Checklist and so forth are the basis for these distinctions.

There is a difference between the used classification tools in juvenile justice practice and in neuroscientific research. It also became apparent that neuroscientific research does not use risk assessment tools established in juvenile justice practice and vice versa. It can be concluded that there does not appear to exist a precise definition of aggressive behaviour in either of the social worlds.

It has been argued that aggressive behaviour can be established as a boundary object between the three social worlds of juvenile justice practice, training provision and neuroscience. The social construction of aggressive behaviour as well as the establishment of aggressive behaviour as a boundary object is relevant for the utilisation of this specific knowledge in the context of this dissertation. The reason for this is, that these different elements of knowledge and conceptualisation of behaviour influence the way practitioners perceive aggressive juveniles, undertake their day-to-day practice, as well as how neuroscientists investigate a specific behaviour and training providers transfer and utilise knowledge.

The next chapter explores the neuroscientific research findings relevant for juvenile justice practice and how practitioners use them in their day-to-day work.

7 Cortisol, Brain Development, Attachment Theory and Juvenile Justice Practice

1 Introduction

The previous chapter has shown how practitioners and training providers in juvenile justice practice as well as neuroscientific publications conceptualise aggressive behaviour. Chapter 2 has presented important areas of neuroscientific research, which were mentioned by the interviewees; namely attachment theories, brain development, stress responses, and the influence of cortisol on the developing brain. These areas of research are revisited in this chapter by briefly discussing the training offered to practitioners. This is then followed by a critical examination of one narrow area of neuroscientific publications, namely research focusing on cortisol in aggressive juveniles. After that, a brief overview and examination of the concepts and theories provided by Dr. Bruce Perry is given. He is a key figure for stipulating knowledge to training providers and practitioners in Scotland. Trauma and stress studies, studies on brain development, research on cortisol as well as attachment theories are part of Perry's overarching concepts. The process of how specific findings are transformed and established as part of the practitioner's professional knowledge base is investigated. This is then followed by an investigation of the role of images in the process of knowledge utilisation and translation. Interviewees have regularly referred to a specific brain image when reflecting on neuroscientific knowledge in juvenile justice practice. These powerful images are important in simplifying complex neuroscientific knowledge to a lay

audience. They have therefore the function of 'agents' in the knowledge translation process. The critical investigation of cortisol research and Perry's work provide the context for the investigation of how practitioners and training providers view neuroscience in the context of their work. The use of this knowledge by practitioners is then investigated in the context of their day-to-day work.

2 Training offered to juvenile justice practitioners

Neuroscientific research on aggression covers several different areas including brain development, brain imaging, psychophysiology, hormones and neurotransmitters, brain plasticity, psychology and rehabilitation, to name just a few. In the context of juvenile justice, neuroscientific knowledge is only relevant if it relates to aspects of the day-to-day work. This study has shown that only a fraction of the neuroscientific research publications are eventually utilised in the practice context. The different local authorities and institutions offer training courses on a regular basis through individual trainers as well as in-house training to practitioners in juvenile justice services across Scotland. The training includes topics such as, for example, attachment theory, brain development research and the negative effects of cortisol on the development of behaviour and relationships. However, the interviewees stated that these topics are mostly included in wider topics relevant for juvenile justice practice. An example would be a training course offered on assessment of offending behaviour, which includes aspects of attachment theories, brain development and stress responses. Also there are only very few specific training sessions on aggressive behaviour on offer; most of the knowledge about aggressive behaviour is again included in training on wider topics.

However, most of the interviewed practitioners stated that they have attended at least one training course about attachment theory. Consequently, the following sections concentrates on attachment theory and related fields:

> Attachment theory, I guess, is one of the staples of any social work course, disorganised attachments and healthy attachments and the various aspects of that. I think that it is probably more of a standard in children and families work, particularly the young children, but I think that most people whenever they try to develop an insight into someone with significant offending behaviour is trying to understand patterns from childhood and their relationships with key caregivers and stability and consistency. What measures have been used in terms of discipline and attachment stuff is part of that.
> (Practitioner 1)

It can therefore be presumed that practitioners use attachment theory as part of their general theories of assessing young people's behaviours and backgrounds, even if this just happens on a tacit level. This does not only apply to social workers, but also to psychologists who work in the field:

> Attachment theory, Dan Hughes and back to Bowlby. This is the basic training that we did as psychologists. And I think when I first started the kind of attachment theory kind of hit people. It was, well, something I find really really fascinating […] I did go on an attachment training course a few years ago which I found really really helpful. It was a three-day course. And we had to go back and do an attachment interview with a client we were working with, and then come back to the next workshop, which was quite fascinating. I think that was the first time I ever really looked at people's responses in a real sort of attachment framework and you got sort of help with analysing when you went back as well.
> (Practitioner 5)

The intensity of training that practitioners undertake differs. The interviewed practitioners were clear that it is not part of their role to undertake a full 'Attachment Assessment' (Howe and Campling 1995); however, attachment theory is often part of a holistic view and assessment:

Interviewer:

> So how do staff members get that kind of training or knowledge?

Team Manager 3:

> It is a lot of attachment-focused training and part of that is talking about notions of brain development and neuroscience in terms of emotions and people's inclusion of that is that they are then able to bring it back and put it into their practice and into their teams and stuff like that.

It has to be said, however, that there are practitioners who do not necessarily agree with the statements above: 'Attachment theory is now used as an explanation for everything. […] I am not a particular friend of attachment theory' (Practitioner 1). The majority of the interviewed practitioners stated that they use attachment theories as part of their assessment and understanding of the young person's background. Although there might be some workers who do not necessarily use attachment theories, it became clear during the data collection process that they are part of the practitioner's knowledge base, which is relevant for this study. One training provider summarised the training on neuroscience, which is taught as part of more general training for practitioners as follows:

> But they walk away with an understanding of the brain and a basic understanding of cortisol, oxytocin and basic understanding of the brain under stress. If they could repeat it all afterwards, I do not know, but it does not matter.
> (Training Provider 1)

The field of neuroscientific research that could be or is relevant for juvenile justice practice is extensive. In order to investigate the knowledge utilisation process, the following subsection critically examines aspects of neuroscientific research that are translated into practice. Due to the fact that many interviewees referred to 'cortisol' during the interviews, the focus of the analysis is on a narrow area of research; namely the effect of cortisol and its relation to aggressive behaviour. This topic is often included in training on attachment theories.

3 Cortisol levels and aggressive behaviour

As presented in Chapter 2, the HPA axis and the secretion of cortisol are a physiological response of the body to stressors. The underlying hypothesis is that altered levels of cortisol have an impact on behaviour, particularly in response to stress. It is assumed that most articles in relation to aggressive behaviour and cortisol refer to emotional stress responses rather than homeostatic stress responses. However, this can only be presumed, as the term stress is not defined more precisely in most studies (Pacak and Palkovits 2001). Additionally, there is an underlying assumption that there is a gender difference in the way aggression is displayed; most studies focus on males (Moffitt 1993).

In these publications, there is a significant amount of tacit knowledge and 'black-boxing' (Latour 1999) presented. Due to the process of reduction and simplification, various concepts and terminologies as well as procedures are presupposed. This includes, for example, the knowledge about the HPA axis and its relevance for stress reaction; procedures such as the radioimmunoassay used to examine cortisol levels of saliva; psychological and psychiatric knowledge about classification of aggression; methods of undertaking clinical interviews with participants. The details on salivary cortisol collection differ; some authors give very detailed protocols about the collection process (Cicchetti and Rogosch 2001), and others only write a few sentences (McBurnett and Lahey 1991). Cortisol levels are mostly examined by collecting salivary cortisol and by immunoassays, as this is the least intrusive form of examination. However, some studies examine cortisol levels via blood sampling. It is assumed that there are diurnal rhythm differences in cortisol levels as well as developmental differences in levels of measured cortisol (Gunnar and Donzella 2002).

Latour and Woolgar argue that 'the negotiations as to what counts as a proof or what constitutes a good assay are no more or less disorderly than any argument between lawyers or politicians' (1979: 237). The negotiation of neuroscientific knowledge and the establishment of 'facts' have therefore many levels, whereby publications are the end product.[32]

Scientific studies either duplicate already-existing studies to prove or disprove results or try to establish new knowledge by investigating new aspects. It is therefore no surprise that although all the investigated studies examine the relationship between cortisol levels and aggression, each of these studies is distinctive in other ways: for example, different age groups are investigated, some studies have 'normal control groups' (Fairchild et al. 2008), some included comorbidity issues (van Goozen and Matthys 1998) other had a list of excluding criteria (Klimes-Dougan and Hastings 2001).

After establishing the differences and similarities in the chosen studies, it can be concluded that the basic assumptions are the same, although the researchers are from multidisciplinary backgrounds and some of the used terminology is not explicitly discussed or agreed on.

The results in this field are still inconsistent, which offer insights into the development of neuroscientific theories. The externalisations of the claims are conservative and advocate further research: 'The study suggests that reasons of sampling and gender may act as potential confounders in the cortisol-psychopathology relationship' (Rosmalen and Oldehinkel 2005: 483); or, 'the results of the study support that a further investigation of HPA axis sympathetic

[32] In order to investigate these negotiations, study protocols as well as interviews with researchers need to be undertaken, however, thiswas out with the scope of this dissertation.

autonomic functioning in the origin and maintenance of aggression in young boys is warranted' (van Goozen and Matthys 1998: 539). The only exemption is van de Wiel and van Goozen who suggest 'if these results are replicated in larger scale studies, it is possible in the distant future to select the best possible treatment options for an individual based on the outcomes of a biological screening procedure' (2004: 1017). The conservative externalisation of the claims can be seen as an indication that this knowledge is not developed enough and claims cannot be generalised yet, possibly because the results are still inconsistent (Popma and Vermeiren 2007).

A question remains, however, how these links can be made when this complex behaviour is classified and assessed with different methods and no agreement can be found on what actually counts as aggressive behaviour:

> The mixed cortisol findings for children and adolescents may be due to important methodological differences among these studies. First, the label 'antisocial' has been used for behaviours as different as physical aggression, running away from home, stealing and drug use. (van Bokhoven and van Goozen 2005: 1984)

An interview respondent who is a researcher from a Scottish university and is also involved in training events for practitioners, based her research on the link between cortisol and behaviour on studies which have found that children coming into foster care show a different diurational rhythm in cortisol compared with control groups. This difference is similar to patterns in children with conduct disorder and adults with antisocial behaviour disorder and psychopathy. Interventions based on attachment theories are used to treat these in this specific study, which has received positive results. She reflected on the study during the research interview as follows:

> We were interested, if school-aged children who were maltreated and are now adopted in stable placements still show un-normal patterns and it actually
>
> shows that their diurnal rhythms were normal. But looking at the secretion over the day it was slightly, but significantly lower, than normal compared to

> the control group. So there is something going on there, we got the sense that the fact that the rhythm had returned to normal, to normal medical limits but compared to the control group slightly higher. […] Cortisol is so important that maybe at the expense of other parts in the cycle that are more difficult to measure. What we have hoped to do was to look at other parts of the HPA axis by examining the urinary cortisol levels. But the problem is actually getting that would be really difficult. […] And we don't know what is cause and what is effect. Also, studies show that some children have a smaller hippocampus who have ADHD, but we do not know if they have a smaller hippocampus before or after the cortisol.
> (Researcher 1)

In summary, there are various different factors in the investigation of the relationship between cortisol and aggressive behaviour that are still not resolved or require further investigation: there is not enough consistency within the definitions of aggressive behaviour and its assessment; of the terminology related to 'stress'; regarding the measurements and collection of cortisol and the inconsistent results across the different studies.

4 Dr. Bruce Perry's work

Perry is an American neuroscientist and child psychiatrist. He is relevant for this dissertation as the majority of the interviewees made a reference to his name or his publications and theories. Some of the interviewed professionals stated that they have attended conferences with Perry when he was in Scotland.

Perry established key or core principles as a framework for the 'Neurosequential Model of Therapeutics'. This framework is based on research findings on the areas of brain organisation and function, neurodevelopment and memory, relational neurobiology and attachment, stress, distress and trauma and neglect. He states that:

> Simply increasing awareness of the key principles of development and brain function would, over time, lead to innovations and improved outcomes; oddly enough, even though neurodevelopmental principles impact all child-related disciplines, we rarely teach the core concepts and facts of neurodevelopment to our trainees in education, social work, medicine, law, paediatrics, psychology, and psychiatry. (Perry 2009: 253)

The following subsection critically analyses his work with a particular focus on the used discourse.

Perry uses stories from his own work as a child psychiatrist to provide examples of children and their family circumstances and story-telling elements such as: 'The lifespan was short, infant mortality high and the overall population of life on the planet only slowly increased over tens of thousands of years. How different our Earth is today!' (Perry 2002: 80). The other element that often can be found in Perry's writing is the element of using colourful adjectives and adverbs. These elements are used to capture the audience and provide a ground for more complex scientific elaborations. Of course, the writing style depends on the audience and the journal the paper is published in. A different writing style can be found, for example, in his chapter about 'The neurodevelopmental impact of violence in childhood' in the *Textbook of Child and Adolescent Forensic Psychiatry* (Schedky and Benedek 2001). Here, an academic writing style is dominant, and claims are made more carefully:

> A current working hypothesis regarding the effects of traumatic events on the neurobiology of the developing child posits that the specific symptoms a child develops will be related to the intensity and duration of the adaptive style […] present during the threat. (2001: 8)

It is possible that exactly this ability, to present difficult concepts in an engaging language with story-telling elements that provide examples and illustrate more complex concepts, is the key factor that allows Perry to be a successful knowledge entrepreneur for a wide lay audience.

> Bruce Perry, we have had Bruce Parry over here a couple of times. And I read a lot of his stuff. And he is one of these guys who can take complex materials and turn it into very readable stuff. He writes a lot for a website called 'Scholastic', which is advice on teachers, but it really good advice for anyone, care staff as well. So I use his stuff in the hand-outs. I use Bruce Perry's stuff all the time.
> (Training Provider 1)

ChildTrauma Academy

The construction of the homepage, which is mainly based on Perry as a person, suggests that he is a leading expert and all the information provided on this homepage is true, valid and fact. This sets the stage for all the other information that is provided on the page. According to the ChildTrauma Academy (CTA):[33]

> Dr. Bruce Perry. M.D., Ph.D., is an internationally recognized specialist on children in crisis. Perry is the Provincial Medical Director in Children's Mental Health for the Alberta Mental Health Board. He is a clinician and researcher in children's mental health and the neurosciences and he is the Senior Fellow of the ChildTrauma Academy, a Houston-based organization dedicated to research and education on child maltreatment. Perry has been consulted on many high-profile incidents involving traumatized children, including the Columbine, Colorado school shootings, the Oklahoma City bombing, and the Branch Davidian siege. His clinical research and practice focuses on traumatized children, examining the long-term effects of trauma in children, adolescents and adults. Perry's work has been instrumental in describing how traumatic events in childhood change the biology of the brain. He is author of more than 200 journal articles, book chapters, and scientific proceedings.

The ChildTrauma Academy is a non-profit organisation and:

[33] http://www.childtrauma.org

> A major activity of the CTA is to translate emerging findings about the human brain and child development into practical implications for the ways we nurture, protect, enrich, educate and heal children. The 'translational neuroscience' work of the CTA has resulted in a range of innovative programs in therapeutic, child protection and educational systems.[34]

The institute's homepage gives a brief description of this approach as being 'developmentally-informed' and 'biologically-respectful'. The focus is on the work with children at risk where it does not provide a therapeutic intervention or method, but is a way to make sense of a child's life history and current abilities whereby certain aspects of neurodevelopmental knowledge and traumatology are taken into account. It claims that:

> The NMT process helps match the nature and timing of specific therapeutic techniques to the developmental stage of the child, and to the brain region and neural networks that are likely mediating the neuropsychiatric problems'. One aspect of this approach is the integration of the child's relationship and its environment as an important factor for the therapeutic process (Perry and Szalavitz 2006; Perry 2009). The homepage also states that this neurosequential model of therapeutics 'goes beyond the medical model. The Neurosequential Model of Therapeutics maps the neurobiological development of maltreated children.

Perry et al. provide basic neuroscientific knowledge in the form of training sessions and tests on their homepage in order to establish background knowledge. The neuroscientific knowledge concentrates on brain structures and basic function of the different brain areas, the impact of stress and trauma and attachment theories:

> In 1999, CTA expanded its internet presence by launching a free online university (www.childtrauma.org). Again, the first of its kind in the field, participants can work through the self-paced courses on child maltreatment and brain development and communicate with fellow 'classmates' about the material and assignments. Participants come from all fields, perspectives and locales — both within the US and well beyond.

[34] http://www.childtrauma.org

In addition to the free material on the homepage[35], various different distance learning courses and consultation sessions can be purchased through the homepage. There is also an option to become a certified NTM institution or individual when the (purchased) online courses are completed and a certain amount of case-based training sessions has been completed. The homepage also provides links to Perry's books and other literature related to the subject. The set-up of the homepage puts the visitor in the position of a 'learner': all the presented information is there to provide support and knowledge for practitioners and should increase their understanding of neuroscientific ideas on child development, trauma and so forth. Initial information is provided for free, but more in-depth information needs to be purchased. So far, none of the employers of the interviewees has funded this.

It seems clear that Perry wants to improve the work of practitioners as well as improve the service children in need receive. However, in the context of the investigation of how neuroscientific knowledge is translated into practice, it is important to critically examine his work.

Perry's list of citations, for example, from his paper published in 2002 (Perry 2002) includes 7 references to his own work, 6 citations between 2000-2002, 11 citations from the 1990s, 6 from the 1980s, 12 from the 1970s and 11 citations between 1934–1969 (which gives a total of 46 references for an article of 18 pages). Similar observations can be found on the other examined papers. For neuroscience or 'cutting-edge' knowledge, this list of citations appears to be using various 'old' papers, which might even be out of date. Another interesting fact is that Perry only uses case evidence to present his methods. In the context of evidence-based practice, case studies are at the lower end of the quality of evidence.[36] However, a paper

[35] http://www.childtrauma.org
[36] Please refer to Chapter 2 for more details.

published in 2012 by Barfield and Dobson investigates the effect of the NTM approach on 28 children:

> Results from these studies indicate that the use of the Neurosequential Model of Therapeutics approach to determine the nature, timing, and dose of developmentally appropriate activities and interventions within the context of a therapeutic pre-school did improve the social-emotional development of the participating children. (Barfield and Dobson 2012: 30)

The way children are portrayed in his work is by focusing on the effect of trauma. Generally, it can be said that the boundaries between 'normally' developed children and 'maltreated' children are not clear, as the descriptions of 'trauma' are left very vague. An example would be: 'In extreme cases of developmental challenges such as maltreatment – threat, neglect, humiliation, degradation, deprivation, chaos and violence – children express a range of serious emotional, behavioural, cognitive and physiological problems' (Perry 2008: 38). Although this is a long list, there is no reference made to the extent and level of maltreatment or the perpetrator(s). This can also be found in other literature as the concept of 'trauma' is often used in a vague form and incorporates all kinds of difficult life experiences[37]. Here, there is also no differentiation made in the categories of trauma I and trauma II (Terr 1991). This diffuse application of significant concepts seems to be similar to the way the term 'aggressive behaviour' is used (Chapter 6).

Regarding the knowledge utilisation process, the use of terminology has an effect on the way externalised claims are accepted and translated:

> All the potentially defensible steps at lower levels of externality that are embedded in an observational report are themselves taken for granted once an evidential context is accepted. This can be described as the 'black-boxing' of the process of observation. The observation process is now a 'black-boxed'

[37] Examples for the vague use of the term trauma can be found here: Weisaeth 2002; Pearlman 2005; Hutterer 2006; Perry and Szalavitz 2006; Perry 2009.

> instrument (along with, of course, all the associated instrumental practices). (Latour and Woolgar 1979: 29)

In the context here, examples are black boxing of certain terminologies like stress, trauma or aggressive behaviour, which are based on evidential context but lack sufficient clarity as a consequence.

Interestingly, these critical considerations are often not translated into practice and the knowledge that is then used is viewed as 'facts' to promote ideas, concepts and messages that fit in with the general (ideological) approach or (political) agenda. Similar observations can be found in other areas of neuroscientific research, for example, research on brain development and aggressive behaviour or the concept of emotional regulation.[38]

Action orientation (Willig 2008), or what is gained from positioning neuroscientific knowledge in the context provided above, seems clear: it portrays a picture of children and adults within a certain parameter. Here, this refers to what is considered to be normal and socially acceptable and incorporates a certain understanding of behaviours, which do not fit within those categories. Additionally, the described discourse establishes Perry, and certain neuroscientific research publications, as an expert on child development and on the consequences of traumatic events. It also positions Perry and his colleagues as being the leaders for a new approach to healing child trauma with the help of cutting edge neuroscientific knowledge. The result is that this increases the knowledge of a wider audience on the effect of trauma on children's brain development and its consequences.
For example, knowledge on the effects of traumatic experiences during childhood which might lead to psychiatric disorders later in life; or research on children who

[38] There is extensive literature on the question of emotional control and regulation, which goes beyond this study, for example, Gross 1998; Ochsener and Gross 2004; Ochsner and Ray 2004.

have experienced trauma might develop symptoms of post-traumatic stress disorder (PTSD) (Perry 1997). Although this is very important knowledge for practitioners, in the context presented here, this might lead to certain generalisations and perspectives on children with difficulties that might not be intended. Additionally, it supports the establishment of 'facts', which are not necessarily as stable as they are presented to be. These two important points are discussed over the next few chapters.

The following subsection investigates how the process of building 'facts' is established in broader overarching theories that are translated into juvenile justice practice.

4 The establishment of 'hard neuroscientific facts'

Perry states in his book *The Boy Who Was Raised as a Dog* (2009) that his theories and methods are based on 'hard science'. What does the terminology of hard science mean in this context? Hard science can, for example, be understood as research that can be proven and facts that can be established and which are replicable through experiments. The importance of these used terms ('hard science', 'facts') in the context of promoting this knowledge in the translation process endorses an importance of this knowledge and a superiority of this knowledge. This problem has been discussed and raised by various different authors already; one example would be Hedges (1987) comparing the physical sciences against the social sciences: 'It seems, however, that the 'obvious' conclusion that the results of physical science experiments are more cumulative than those of social science experiments does not have much empirical support' (Hedges 1987: 443). Nonetheless, this problem can also be transferred to the difference between neuroscience and social science, maybe

even more so as neuroscience usually involves a multidisciplinary research team and is based on psychological and sociological assumptions and theories. The multidisciplinary approach in neuroscience investigates the complex interaction between the brain, the nervous system and behaviour. This suggests that research studies and findings are influenced by the humanities and the social sciences in the form of observations and psychological theories. The integration of neuroscientific knowledge into overarching theories that are applied to practice and taught by training providers and consultants are, therefore, based on psychological theories and concepts that stem from particular views of how to best raise a child. They are based on a certain understanding of childhood as well as concepts based on welfare ideas (Bruer 1999) and the best and most productive citizen (Fricke and Choudhury 2011).

The terminology, which is used by Perry and others, suggests a high standard of research results, which are robust and established. For the context of juvenile justice and neuroscience, this would mean that research developed by neuroscience and used in the overarching theories and concepts are, actually, proven and established 'facts' ready to be used and taken up by practitioners.

> These trends are strengthened by the tendency that neuroscientific claims and explanatory patterns are often treated as authoritative – likely because of their alleged 'hard' scientific validity – even with regard to important normative questions in the domains of morality, ethics, and social policy. This happens despite the fact that many of the experimental results and their theoretical articulations are unstable and provisional at the current stage of development in brain research. (Slaby 2010: 398)

It is therefore no surprise that speakers and publicists like Perry not only reach a wide audience but manage to be seen as a 'guru' in the field of children and families social work: 'He is a very charismatic speaker, he is one of those guru guys' (Training Provider 1). Training providers as well as practitioners were aware of his name and are aware of at least parts of his work. When people speak about

someone as a guru, this could lead to an uncritical and unquestioned belief in the proposed knowledge. There is an element of trust that presented facts are valid and true (Latour 2001). This trust is even more established in the context of juvenile justice practice: Either, the practitioners have no knowledge of the field of neuroscience, or the knowledge is limited to very basic facts with which a critical perspective cannot be achieved. One training provider stated on neuroscientific research and the role of Perry:

> I suppose I am like any practitioner really, I don't have, there is not enough of the hard science. I mean I have this cautionary voice in me that is saying, mmh, and there is not anything to substantiate, not really. It is only Bruce Perry.
> (Training Provider 5)

It can be summarised that Perry, by using a specific discourse and presenting difficult concepts in a charismatic way to a lay listeners and readers, results in a wide audience of practitioners that accept and integrate this knowledge into their practice.

This is additionally secured by the development of an institute and an online page that provides free knowledge. Particularly noteworthy in the context of juvenile justice is that Perry's work mainly refers to trauma-related research, early intervention, child protection and so forth. It is often directed towards foster carers, early-years officers and child protection workers. It is not a juvenile justice theory, however, the majority of the interviewees referred to his name and his work.

This critical examination above provides the context for the investigation of the knowledge utilisation process and how this specific knowledge is shaped and adapted during its path from neuroscientific publications to juvenile justice practice.

6 Images as agents

The power of images is of particular relevance in the process of knowledge utilisation in this context as images can be used to make convincing arguments without the need to explain too much scientific detail. This is of importance, as practitioners and training providers usually do not have any neuroscientific background knowledge they could build on. During the interview process, nearly every interviewee made reference to this particular image, which, therefore, requires specific analysis: it shows the brain of two three-year-old children: one is 'normally' developed and the other child has been suffering from extreme neglect.

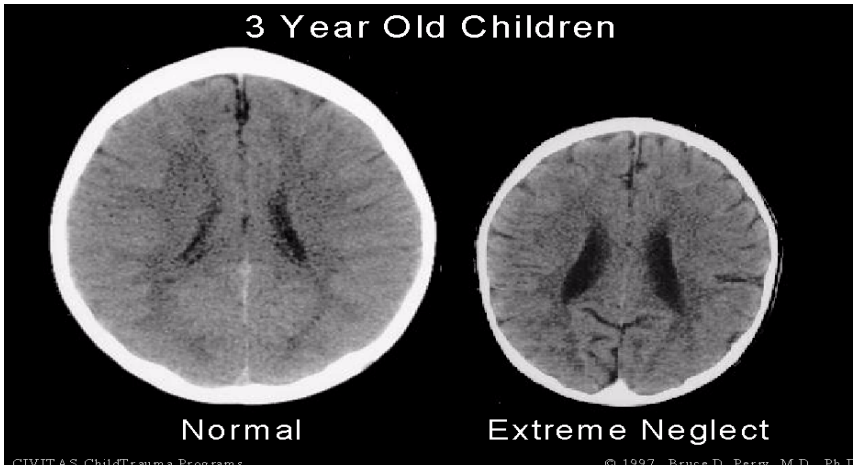

Image 8: Altered brain development following global neglect in early childhood. Society For Neuroscience: Proceedings from Annual Meeting, New Orleans (Perry 1997)

Perry used this image during a conference in 1997. Additionally, the image was published by Brain and Mind in 2002, whereby the following explanation was used:

> Abnormal brain development following sensory neglect in early childhood. These images illustrate the negative impact of neglect on the developing brain. In the CT scan on the left is an image from a healthy three-year-old with an average head size (50th percentile), the image on the right is from a three-year-old child suffering from severe sensory-deprivation neglect. The child's brain

> is significantly smaller than average 93rd percentile) and has enlarged ventricles and cortical atrophy. (Perry 2002: 93)

The interesting point here is the difference in terminology for the conference proceedings compared with the paper published years later ('global neglect' and 'severe sensory-deprivation neglect'). The generalisation to global neglect for a conference audience seems to be used to make the argument more convincing.

This image reduces the complex, neuroscientific knowledge with regard to brain development (for example, how neurons work and develop or how the brain reacts to stimulation and learning) in two simply and easily understood images. Joyce states that 'an examination that surrounds and informs the production of medical images demonstrates that these pictures are highly mediated presentations that are influenced by the decisions and values during all aspects of the production' (Joyce 2005: 437). There is no mentioning of technical details of how these images were made, what kind of resolution was used, who has made these images, under which criteria this particular slice of the brain was chosen, and so forth. Here, the detail of the resolution or the decision about which part of the brain should be highlighted is not relevant; the only relevant message that is transported is the size of the brains. Another important point about this image is the choice of black and white colours to increase the focus of the viewer on the difference in size. Rose (2010: 75) states:

> A lot, then, is 'black-boxed' in that image, and brain mappers themselves view with some concern the proliferation of these images as if they were simple photographs or X-rays, and their utilisation in popular and professional discourses.

The critique on brain imaging was summarised by Klein as follows: 'I conclude that we should view neuroimages as auxiliaries to evidence, rather than evidence proper' (2010: 266). Going beyond the technical details, the image also contains no further detail about what neglect means for this three-year-old child; if the child

actually suffered from another brain damage or medical condition that would explain this development from a different point of view. Additionally, there is no explanation if this is just one child that has a small brain by the age of three but later on in life has caught up with the development. Additionally, important information would be if the normally developed child maybe has a medical condition that has made his brain grow bigger or the other way around, and so forth. It can only be assumed that Perry has raised these questions as parts of the research project where these images have been produced.

The images are used without context; the stories of these two children are not explained, which would highlight how they have been raised. Instead, the vague terms trauma and neglect are used in this context. This leaves the interpretation to the receiver of this knowledge utilisation process. What is meant by neglect and trauma? These two terms occur and are used in different contexts with different emphasis and for different events. The interesting point here is that it is not necessary to explain any details; the images have been chosen so that the viewer automatically understands what Perry is trying to say. However, 'imaging gets positioned as true and objective while clinical examination and other low-tech procedures often get labelled as misleading and subjective' (Joyce 2005: 439).

The image suggests offering 'the truth' about brain development and the influence of neglect in this process. This powerful tool is used in the knowledge utilisation process to transport a very simplistic message, while hinting that this message is supported by complex scientific research:

> Turning then to the postproduction events for images, particular images are selected for publication and presented in journals. At the heart of this process is a common standard, and often encouraged practice, of selecting extreme images. This is an acknowledged, troubling practice, necessary for scientific work and yet increasingly problematic as these images travel outside expert

> circles and into popular cultures, where new, less-qualified labels are applied. (Dumit 2010: 199)

The image therefore obscures the complex neuroscientific findings from which it is abstracted.

Practitioners work with children who often, but not always, have suffered from neglect or trauma when they were infants and toddlers. By using this image in this context, the fear and respect of neuroscientific 'lay people' towards neuroscience is taken away and the message is transported immediately – a new message that Perry wants to convey to practitioners rather than to scientists. This is a similar finding to Cohn's research with psychiatric patients (2012).

Bruer (1999) has made similar observations in the American press and policy circles: Perry's image was published by *Newsweek, Time* and appears in the Congressional Record of the Early Childhood Development Act of 1997. Bruer has contacted Perry to investigate this study more closely, however, he states that:

> Perry's finding is at best a preliminary result that no doubt, he and his colleagues will build on and elaborate when they eventually do publish it in a scientific journal. Such a finding, even a preliminary one, should not be taken lightly. However, it should strike us as odd that such an isolated, obscure result appears so widely and prominently in the Myth literature and is cited as the brain-relevant fact in federal legislation. It suggests that the facts appear is due more to the image it conveys than to the scientific and evidentiary weight it carries. (Bruer 1999: 204)[39]

Clearly, using this image in order to translate and transport a message is powerful and works very well. The notion that images are representatives or appear as reality still sits deep in us, even though we live in the time of digital photography with all its manipulating options. Lynch refers to the establishment of facts through the use

of visual images as follows: 'Visual displays are distinctively involved in scientific communication and in the very 'construction' of scientific facts' (Lynch 1990: 154).

This image has proven so powerful, that it is used in various different presentations and other publications discussing all kinds of aspects of brain development of children in the context of neuroscience.

The strong effect of this image is based on the fact that it *intuitively* transports the message that neglectful parenting has a significant impact on the (brain) development of children and is already visible at the age of 3 years. For practice, this highlights various different issues that need to be considered when working with aggressive juveniles.

The following subsection investigates if and how this knowledge is used in training and practice.

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[39] In his paper, Perry (2002) refers to other papers, for example, Rutter (1998) and O'Connor and Rutter (2000, 2001) for further studies on this relationship.

7 The perspective of training providers and practitioners on brain development, attachment theories and cortisol

It is now important, to investigate how practitioners and training providers view the described theories and how they conceptualise them in the context of their work.

One training provider explained this link between attachment difficulties and aggressive behaviour as follows:

> Now the new understanding for me in recent years has been how much a helpless caregiver can produce rage. Because if you are in a situation where you are with someone who is falling apart and you are developmentally immature, one of the things is you need to take control, because otherwise the whole thing is going to fall apart. And it makes absolute sense to me that you need a parent that is off their face with drugs or you know, emotionally unavailable through depression, extreme depression or whatever, that the child is still in an impossible situation. They might be being abused – but they are in an impossible situation, and it makes absolute sense to me that that can premeditate rage.
> (Training Provider 5)

This statement highlights the importance of understanding a child's and young person's life history and parenting experience. These experiences are put into context by attachment theories and this helps practitioners and training providers to comprehend why a person displays aggressive behaviour.

> You tell people about attachment and about disorganised attachment and insecure attachment and attachment theory etc., but at the end of the day it is only a theory. And I ... maybe this is why you are asking, I guess the thing that has given it a whole lot of validity is neuroscience.
> (Training Provider 1)

Although the citation above is more directed to social workers working in child protection or permanency settings, these thoughts also play a role when working in juvenile justice settings in Scotland. It acknowledges the fact, that the discussed knowledge on the different forms of attachment is based on theories, not facts. However, now, neuroscientific research findings have given these theories more credit. Over recent years these theories seem to have received increased attention since they have been 'validated' by neuroscience research. It can therefore be concluded that attachment theory plays a role in juvenile justice practice for the assessment and understanding of offending and aggressive behaviour. This is an interesting point that needs further investigation:

> Neuroscience has come along and has started to look at brain development neuro-pathways, you know, that kind of thing, and is kind of saying all that stuff that Bowlby wrote about was observation but the science is backing it up. And we now know that if kids are loved and feel safe and this that and another, and if you are securely attached, feel safe enough to explore your environment, and if you feel safe to explore you are ready to go to school. And if you are securely attached you are ready to learn and and you will take risks and explore things and so on. And you will see the adult in that school as a secure base because that is your internal working model anyway of adults and so you are in a great position to progress through life and to learn to fulfil your potential. Kids who have not learned that kind of thing or have been traumatised or neglected, will be hyper-aroused, preoccupied with other things, misinterpret behaviours; watching body language rather than watching or listen to what has been said and so on, so they are not in such a good place. Okay, getting back to the question about neuroscience, is that it is the advances and what we are discovering is that those theoretical models, they are concrete and they are kind of matching each other and they are kind of confirming each other if you like, and so it adds weight. It almost vindicates that stuff … when we started out about ten years ago saying attachment theory should be the theory we use in residential care as the basis for everything we do.
> (Training Provider 1)

This means that this neuroscientific research is not necessarily 'new' knowledge but it supports existing psychological theories about the development of behaviour and relationships, which can include research on brain development and the stress

response. The training provider uses the term 'confirm' in this context, whereby he refers to scientific research that, somehow, gives more weight to these established theories and makes them more 'valid' than it was possible in the past through observation and experience. This is also summarised by another training provider as follows:

> I mean … the brain can change. There are people who still do not know that to be true, and the people who know it to be true but choose not to believe it. The people definitely do not know about the use it-lose it principle … that there is a pruning that goes on and that there are critical periods for certain things, and even just thinking about what happens when their brain is under stress. So you just happen to make them think what their brain does when it is under stress and they kind of very acutely go, 'oh yeah, you can't think, your mind goes blank'. So it makes it very easy to then say, so physiologically this also happens, the messages are going down your more primitive brain and activating the fight and flight response and it is harder to access, the neocortex and the kind of planning and rational side. And it is really just about doing little exercises so that they can explore this for themselves and you just back it up with science all the time. But I think most people, like a lot of neuroscience … is confirming what is absolutely common sense. And all you are doing is affirming their practice both for staff and for parents, but giving them the confidence that they are doing the right thing. And I think that that counts for a lot.
> (Training Provider 2)

These observations have also been found by, for example, Askeland and Payne (2001) and D'Cruz (2009). They have theorised that scientific knowledge can support and validate knowledge gained through observation and experience. The relevance of attachment theory in this context can be seen, as Farmer calls the consolidation of neuroscience and attachment theory 'Bowlby's missing link' (2009).

The next quotation suggests how neuroscientific research, like brain development and plasticity, is combined with attachment theory. This knowledge is then put in a context, which is useful for practitioners and therefore 'validates' existing knowledge:

> We know now that … a secure attachment in the early years can help with brain development. And we know about the brain's plasticity from this time to that time and we know that fits with internal working models. And we know … how connections are made and we know that we have to have pattern repetitive to, for us to learn these things.
> (Training Provider 1)

This particular quotation cites concepts established by Perry. Here, it is important to note that the training provider does not refer to *theories* anymore, but refers to this knowledge as *facts*.

A practitioner stated that he believes that working with juveniles on a more cognitive level results in 'altering someone's thinking [which] has an effect on neuropathways'. Clearly, the importance of the neuroplasticity complexity receives attention and helps to justify the work people are doing in practice. The important point here is that neuroscientific research influences terminology and the way established theories are explained. Practitioners' awareness of the influence of neuroscience on the importance of attachment theory for the work can also be seen as follows:

> I think, the stuff about brain development has probably been gaining a bit of a higher profile and it was not that long ago, maybe 18 months or 2 years, when the Chief Medical Officer ... is that Harry Burns? Have you come across stuff that he has done about again brain development? And he is using research with monkeys and they have done a series of experiments; that was more about the impact of poverty and disadvantage generally on individuals' developments.
> (Practitioner 1)

Dr. Harry Burns, the Chief Medical Officer in Scotland since 2005, regularly speaks at conferences for practitioners across the country and promotes early intervention models.[40] Here, early intervention models refer to interventions during the early

[40] For example, during 'Flourishing Infants in Fife Conference 2011', http://www.saphna-professionals.org/node/533.

years of life rather than early intervention in the context of juvenile justice services. These can be facilitated by health, education and social work services as well as voluntary organisations. The goal of early intervention is to prevent young people from 'coming off the right track'. It aims to provide them with the best possible care and nurturing so that they will not need support, for example, through juvenile justice or mental health services later in life (for example, Scottish Government 2008)[41].

One practitioner referred to early intervention and the way neuroscientific research influences the trend to increase early intervention models as follows:

> And I think quite often because they end up here, in many ways you can see when you would have done something. It would have been a lot easier and the brain – again my limited knowledge of the brain – but presumably at a younger age the brain is more malleable and less sort of set.
> **(**Practitioner 4)

7.1 'Trauma-informed practice'

The majority of interviewees regularly mentioned the concept of trauma when discussing aggressive behaviour and neuroscience:

(Focus Group, Programme Workers, Secure Unit)

Programme Worker 3:

> Every kid that comes in, and that you work with, must have had something occur or something has happened for them to be here. So it is always … trauma is just the first thing that comes into my head. Of experience and why they behave in this way.

[41] The concept of early intervention can also be found in frameworks for practice, for example GIRFEC (Getting it right for every child). Please refer to Chapter 2 for more details.

Interviewer:

> So what you are actually saying is that basically every kid that comes here to the units must have had a very traumatic background?

Programme Worker 2:

> We did a young person's research piece last year and it was a questionnaire that covered family background, trauma, environmental experiences, mental health and offending. And it came out really really high: something like something like between five and seven traumas was like 97% or something.

Interviewer:

> So what is trauma in that context?

Programme Worker 2:

> There was a kind of range of different types of trauma, like experience if you like. Like witnessing domestic violence, maybe experiences of abuse. There would be a range of different kinds of trauma experiences if you like. And the range would look at how many of those different experiences were applicable to that young person. And I think with anybody, there would some sort of trauma.

Programme Worker 3:

> There was nobody who had none. The majority had five or over. And then environmental experience as well as witness of domestic abuse, witness of parental separation, and all the different kinds of trauma that you would be experiencing during the development and they were really high as well.

The interesting point here is the focus 'trauma' has received during the interviews. Although trauma is mentioned in the theoretical literature for reasons of offending behaviour and aggression, other aspects are usually mentioned as well: the influence of peer pressure, poverty, risk-taking behaviour and so forth (Schmitt 2008; Whyte 2009). However, during the interviews the focus was on trauma and other influences have not been mentioned.

A social work PhD thesis on trauma, neuroscience and social work states:

> What has not been traditionally considered is the relevance of trauma to youth with conduct-related disorders and within that consideration, the neurobiological impact of trauma on these youth. A multitude of research evidence suggests that trauma is key for understanding the development and persistence of conduct-related problems in youth. (Sampson 2010: 253)

Neuroscientific research and also Perry's concepts are based on traumatology, which, like attachment theory, has gained additional focus through neuroscientific research. This then leads to various new thought processes for the assessment of aggressive juveniles by practitioners: for example, questions have been raised by interviewees regarding the impact of violence on the developing brain. A few practitioners mentioned the idea that young people who offend or display aggressive behaviour have suffered from a physical trauma to their head during their early years. For example, one practitioner stated that he believes, based on his personal experience as a juvenile justice practitioner, that

> offenders are often hit on the head. There is often brain damage through the impact of violence on them: for example, as they have grown up with a lack of supervision in their childhood, therefore more accidents happen.
> (Practitioner 10)

Another practitioner stated that he feels that there is a lack of knowledge on the influence of violence on the brain, which results in brain damage: 'What do you do when they have lost part of the brain – how can you redevelop this?' (Practitioner 9). The impact of trauma on a young person's brain is therefore understood as a loss: the question here is; a loss of brain matter, neurons, or something else? However, something that might not be lost forever and might be rebuilt. A training provider stated:

> Accidents these children have in terms of neurological assaults and injuries, and that there are lots, I think that this is very relevant for some of the children. Like for example, the other day I am seeing these two little boys who are in a placement, […] a three-year-old that is not speaking at all. They've all got flat heads. Because they have been neglected, so what are the neurological

> consequences of that? But also, they had all kinds of injuries so some of them might have been non-accidental but most of them were accidental because of poor supervision and protection. But even what you see is neglectful circumstances, and one of the boys would hit his head very very hard, but you do wonder. So accidents and other consequences of extreme neglect. So this pal of mine would always say, some of those children have injuries, have brain injuries, so some of these children he [reference made to another training provider, comment by writer] would investigate and the assumption was that they had attachment difficulties, poor parenting etc. But he would say, no there is a different neurological profile here, so it is not a learning disability or an unaddressed learning difficulty which is another whole area, so that makes sense. You see that there is a whole range of things and at one end, the extreme end, is neurological assault if you like through an injury or accident that has not been attended to, that was not noticed.
> (Training Provider 4)

This statement shows that neuroscientific knowledge can help to explain these behaviours and difficulties by physical determinants. This then goes beyond psychological theories and the explanation is assuming that there is concrete physical evidence in the brain of the child:

> Just coming back to those pictures of the brain, this is very concrete and for people to see, it is not just, […] a lot of people say things like: you can choose to behave in a certain way, he can choose to control his behaviour if he wants to. I mean I have heard that lots of times from a social worker or school staff, whereas I think, if you could show that teacher this picture and say this is his brain compared to your brain, and this is the difficulties he has to overcome. So his ability to choose to behave in a certain way is not the same as your ability, and sometimes he does behave in that way – but this is not down to him having the ability to choose as lots of people would.
> (Practitioner 4)

These statements show that knowledge is used to increase the understanding of young people's behaviour. This is done by saying that they cannot choose how they behave. The explanation for this is based on the different developments of their brains and therefore the development of their attachment behaviours and their emotional regulation. Following these explanatory framework means that these

juveniles are not as much in control of their behaviours as other children who do not offend due to a somewhat 'different' brain.

Part of this process is the generalisation of neuroscientific findings, which is explored in more detail over the next subsection.

8 Generalisation of neuroscientific research knowledge and externalisation of research findings into practice

> Yeah, and I think it is funny because there is a lot of development into attachment disorders or so. It is … where do you distinguish? It is quite often putting a label on something is not helpful, I think you can kind of differentiate. If somebody, let's say, had a history of abuse and neglect, they can have the same difficulties as somebody on the autistic spectrum, they can have similar difficulties. If you did a brain scan on them or something, I mean I am not a … so I am guessing a little bit here, but it is not due to the same reasons, but it can have the same impact so it is very difficult to kind of pinpoint them all. I think we see a lot of kids where there is a clear history of abuse and neglect but they might be on the autistic spectrum as well and sometimes I think it is kind of difficult to figure out what is going on for the young person.
> (Practitioner 4)

The above statement by a practitioner indicates, that the impact, trauma and neglect have on the development of the brain and the behaviour the young person then consequentially displays is similar to the impact a disorder on the autistic spectrum has on behaviour. Here, no distinction is made on the level of abuse and neglect, which age group, on which end of the autistic spectrum, what behaviour and what motives for behaviour. This is a typical pattern that was observed during the interview process: practitioners use a generalisation that is based on generalised statements from brain development and attachment theories which are then applied

to the observations of the day-to-day practice. As explored above, this process already starts when findings from neuroscientific research publications, such as cortisol research, are applied to more overarching theories and this knowledge is then generalised in knowledge about a group of young people who are 'traumatised'. It is important that these findings are put in a context of theories that can be applied to practice. However, the trade-off is a lack of care towards the externalisation of claims, during every single level of the theory building process, whereby theories are created that are then established as 'facts' by knowledge entreprenteurs.

As demonstrated in Chapter 6, particularly practitioners and training providers with a practical background seem to draw on the theoretical literature in a different way compared with other professional groups. This becomes again important in the context here, as no reference is made to the externalisation of the claims and that the neuroscientific results are based on theories: practitioners could rarely tell the sources of research this knowledge is based on. This suggests that a lot of the knowledge is passed on and enters the tacit knowledge pool of the practitioners, yet there is no need to retain information about individual research studies or books. Or, as a training provider stated: 'I do not know where that information comes from because it just seems to be out there everywhere' (Training Provider 1).

The above cited training provider was openly admitting that he does not know the source of this research and in his experience everyone is referring to it and making statements about it. What can also be seen here is that complex neuroscientific research summarised at the beginning of this dissertation is reduced to very general statements about key factors relevant for practitioners: the impact of trauma, brain plasticity, how connections within the brain are developed and how important repetition is for this process. Another example for the reduction of the complexity of

this is a statement by a training provider: 'It is about the toxic cortisol; that is what we are really interested in' (Training Provider 4).

It seems, for practitioners, differentiated and complex scientific research findings, discussion and considerations are not necessarily important knowledge for their day-to-day *practice.* For them, findings that increase their *understanding* and *support their knowledge* during the assessment and intervention process are relevant.

So far, it has been established that practitioners and training providers are familiar with certain aspects of neuroscientific knowledge. The next subsection investigates how and if this knowledge is used in practice.

9 Neuroscientific knowledge as an explanatory framework

Theoretical knowledge relevant for juvenile justice practice serves different purposes, however, one important aspect of knowledge and theory for practitioners can, according to Trevithick's framework, be defined as knowledge that helps to develop an understanding of the service users juvenile justice practitioners work with (2008). This understanding is, of course, essential for the successful work in juvenile justice. Here, one training provider used an example of school staff referring to an aggressive juvenile:

> And I still go to schools, for example, where they say – not just schools, actually – I still talk to people that sometimes say: 'But do you not think that he is a bad bastard, you know? Do you not just think that he was doing this just out of spite? Or do you not just think that sometimes you know, basically, there is nothing wrong with him, he does not really have a problem? And you

> tell me all that crap about insecure attachment and problems at home, and he brings them in here, and I should not take that personally, bla … .' (Training Provider 1)

As this citation shows, it can be assumed, that (neuroscientific) knowledge used in practice is often cited in the context of achieving a better understanding. This can sometimes be in contrast to the understanding of parents or other professionals who do not have that knowledge. The goal is to achieve a shift in thinking which then results in a shift in attitude towards the juvenile offender for the practitioners. The important point here is that this knowledge is clearly used to strengthen arguments. The use of these ideas for the practice of practitioners sometimes results in a different way of explaining this behaviour:

> I suppose, if a parent asks: 'What is wrong with my child? There is something wrong with him; he is evil or he is this that and the other', I think, I think … what would help me is having a way of explaining that to parents. (Practitioner 4)

This dilemma of explaining offending behaviour to young people's parents is particularly important when working in a more systemic way with families, which is part of the juvenile justice approach in Scotland. Often during the assessment period, the impact of poor parenting practice is assessed, and as part of the interventions, parents of juvenile offenders are included in the intervention process to promote change. It is difficult to work with parents and families without parents feeling blamed for the young person's behaviour. The practitioner above refers to the use of information on brain development as a form of avoiding blame and therefore reducing the defensive or hostile reactions of family members in order to establish a positive relationship:

> I think as a professional you can understand how brain development impacts on somebody's life; especially the baby, which is becoming more and more sort of routinely apparent to most professions in our line of work. But I think if you could, I do not know … just trying to explain attachment theory to

> parents can be really really difficult. And not doing it in a blaming way because this is not helpful and will not work. […] And I think this is sometimes why paediatricians just do the labelling, there is something wrong with that child – there you go. (Practitioner 4)

What can be seen here is how this knowledge is instrumentalised to shift the focus from explanations, which would create a hostile and difficult working relationship to a more 'medicalised' understanding, whereby the blame is transferred from the parents to the brain. The practitioners' experience is that this externalisation of blame makes it easier for parents to accept interventions and advice. This stands in a paradox to the theories about attachment. As established above, there is an understanding between the links of poor parenting and problematic attachment behaviour. On one hand, neuroscientific research strengthens theories about attachment problems, which involve difficulties in the parent-child-relationship. However, on the other hand, this knowledge is then used to explain problematic behaviour to, for example, parents without the need to blame them for it. It can therefore be concluded that this knowledge is useful as a reference point for various different, sometimes conflicting, explanations.

Another practitioner said that she finds this knowledge useful for her practice in a secure unit, because when she works with young people and their parents she has the following experience:

> It is just more concrete, … you can tell people that he has emotions and difficulties with them. But then you can see the brain and then, I don't know. You have this image. […] So, some people say, 'but you cannot see emotions, and you cannot see feelings'. But you can see the different brains.
> (Practitioner 9)

The neuroscientific knowledge about brain development and cortisol can therefore be used to strengthen arguments with regard to the development of aggressive behaviour and how to change this behaviour towards parents as well as young

people. It seems as if this knowledge provides an explanatory framework that distances the child's brain from the child, from the impact of the parents; and the problems are therefore externalised and abstract.

Additionally, what also can be seen is that this knowledge is sometimes used to explain the development of this unwanted behaviour towards other professionals, and to establish that the young person has no control over his or her behaviour or cannot necessarily choose to behave differently. This can also be seen in the following quotation, whereby the training provider also refers to a change in practice:

> I do think that neuroscience has a potential for social work. Because I think that beginning to look at issues through that kind of lens and think about the neuroscience … might it be a physiological reaction or lack of reaction or connection or lack of it linked to the environment makes a lot of sense to me. And also, taking that perspective has helped me to understand some children who otherwise would have been completely puzzling. And has helped us in certain practice fields with children to develop strategies arising from that understanding.
> (Training Provider 4)

As this knowledge goes hand in hand with the welfare idea it can just readily be incorporated into existing theories and observations about aggressive juveniles.

> So we did not know at that point in time, that there was a whole lot of neuroscience there saying how – Susan Zeedyck as well – is saying, yes this is what happens with secure attachments and this is what your brain looks like when you are in an Romanian orphanage, and the differences in relationships and the differences, sometimes, yes the differences in feeling safe and feeling loved and self-esteem and all of that. So, yeah, that science comes along and really backs up what we are saying.
> (Training Provider 1)

This knowledge provider here clearly links neuroscience and attachment theories too an explanation model for difficult behaviour. Although the reference to the Romanian orphanage research (for example, Rutter and Beckett 2007) speaks about neglected and traumatised children who have been deprived of nurturing care and love, the explanation model used here is focusing on a different aspect: not on the reasons why, but on the end result of the caused damage.

Pickersgill argues in his study on neuroscience and psychopathology that: 'Within clinical practice, the promise of neuroscience has considerable traction, acting as an interpretative framework with which understandings of patients and treatment can be articulated' (2011: 456). This can also be seen here, as practitioners use neuroscientific knowledge as an explanatory framework to strengthen arguments and theories, shift focus and blame and 'validate' existing practices and approaches. By drawing on Trevithick's knowledge framework, neuroscientific knowledge serves, very limitedly, as factual knowledge. The limitations lie in the fact that practitioners and training providers in this study could not refer to the research they have cited. Therefore, neuroscientific knowledge mainly functions in the role of 'theories that illuminate our understanding of people and situations' (Trevithick 2008).

As established earlier in this chapter, it has to be said, that not all interviewed practitioners find attachment theories or neuroscientific knowledge particularly useful for their practice. There are practitioners who do not 'believe' in attachment theory and probably various practitioners do not know about neuroscientific research on aggressive juveniles. As a consequence, not every practitioner views aggressive juveniles in the context of brain development, trauma and 'brain damage'. However, there is a trend towards a domination of this knowledge and the view of aggressive juveniles in this context. Or, as Trevithick states: 'For example, on UK social work training programmes, I have experienced a shift in the

importance given to sociology. In relation to practice, we see less emphasis on social causation and greater prominence being attributed to medicine and the 'medicalisation' of personal and social problems' (2008: 1219).

10 Conclusion

This chapter started by critically investigating neuroscientific publications on the relationship between aggressive behaviour and cortisol levels in juveniles. The critical examination of these publications resulted in a conclusion that there are various different black boxes as well as an apparent lack of consistency in the application of definitions like aggression, trauma and stress. The majority of the neuroscientific publications concluded that a further investigation of the different aspects is necessary to allow a more solid externalisation of the research results. However, this fact is seemingly often not translated into practice. This seems to result in very bold statements about the relationship between aggressive behaviour and cortisol by practitioners and training providers. This knowledge is consequently established as 'facts' in the practitioner's knowledge base.

The establishing of facts was further investigated by the examination of the discourse Perry uses in his work. Perry provides knowledge to training providers and practitioners about brain development, attachment, and others, based on neuroscientific findings. These also include cortisol or stress research. Perry's discourse and the way his knowledge is presented plays a role in the way, this knowledge is viewed and accepted by practitioners. This chapter has established a discrepancy between scientific 'facts' and the way this knowledge is presented, perceived and regarded as solid and cutting-edge in practice. Additionally, the generalisation of these statements by practitioners without being able to refer to the

original research, sometimes leads to problematic simplifications and distortion of research findings. This is particularly relevant in the context of aggressive behaviour, trauma and 'brain damage'.

On the other hand, the investigated knowledge is important for practitioners as it allows a validation of existing knowledge and theories, for example, attachment theories, which are used in practice every day. The function of neuroscientific knowledge as an explanatory framework allows a point of reference in discussion with other professionals, parents and for practitioners themselves: it offers the opportunity to blame the brain instead of getting annoyed or angry with the young person.

It can therefore be concluded that the presented neuroscientific knowledge is useful in practice for a better understanding as well as explanatory framework for discussions with other professionals and service users. The impact this has on the understanding and perception of aggressive juveniles is explained in the next chapter.

8 Between Hope, Disappointment, Intimidation and Fascination: The Influence of Neuroscientific Knowledge on Juvenile Justice Practice

1 Introduction

Chapter 6 has established how the different social worlds construct aggressive behaviour. Chapter 7 has then shown what kind of neuroscientific knowledge is translated into practice and how this knowledge is used as an explanatory framework. This chapter focuses on the complex effects this knowledge and, as an agent, the introduced image from Chapter 7 have on the practice with aggressive juveniles where a focus is placed on feelings of intimidation, fascination, hope and disappointment. It is argued that the translated knowledge provides the ground for constructing aggressive juveniles as having 'different' brains to 'non-aggressive' juveniles, and that they can be seen as 'brain-damaged or -impacted' as a consequence. It is further argued that these constructions are easily incorporated in the Scottish system, which is built on a welfare approach and therefore might have the effect of incapacitating young people due to a stronger biologised or medicalised perspective on aggressive juveniles.

2 Between intimidation, hope, disappointment and fascination

This study has shown that neuroscientific knowledge in juvenile justice practice can be perceived through the use of specific images and a specific discourse, which results in the establishment of 'hard scientific facts'. It thereby suggests answers to complex behaviours juvenile justice practitioners deal with every day. Although the 'translated' neuroscientific knowledge is negligible compared with other knowledge practitioners have, it seems to enter the tacit knowledge pool and thereby may be used to enhance an understanding of behaviour. As a consequence, it seems to be used as an explanatory framework, which currently does not provide new methods and tools but influences the way practitioners think about aggressive juveniles. The following paragraphs investigate how practitioners react to this neuroscientific knowledge and what these reactions mean for practice and the conceptualisation of aggressive juveniles.

2.1 Intimidation and fascination

Social work, and also juvenile justice training, draws on various different other disciplines and therefore 'what constitutes knowledge within social work continues to be a difficult subject' (Trevithick 2008: 1213). It can, however, be said that social work and juvenile justice training is less focused on natural scientific content than, for example, a discipline like medicine. Practitioners nonetheless do not feel that this is necessarily a disadvantage:

> I mean, I think any assessment tool is as good as the person using it. And as good as the training they had in how to use it. I would assume in making an assessment tool that psychiatrists or psychologists will be effectively trained in that tool. Will they have greater capacity to understand it, as in to

> understand the knowledge that underpins each question? Possibly. Because that is their area of interest and study of many years, I think that you know there is a limit to how many tools you can master and that we have focused on social work-specific tools. If there were questions that I was uncertain about or there were assessments provided by a psychiatrist that I did not understand, you would aim to raise that with them and ask them to give a clarification of what that means or what this is about.
> (Practitioner 1)

This practitioner appears content with his knowledge and skills and seems to know the boundaries of his role and abilities. As a consequence this does not necessarily negatively reflect on the self-esteem of the profession as he continues:

> I do not have an inferiority complex in a sense that I think that … people choose a line of work or profession that they want to go into to a greater or lesser degree. And I see for example being a competent practitioner, a competent or skilled social work practitioner, I view that as positively as I view a skilled psychiatrist or a skilled consultant psychologist or skilled psychologist. So I guess their use of scientific tools does not wow me, in the sense of, I see that as part of their work in the way that my completion of a Social Background Report for a Children´s Hearing, Does that wow them? No probably not. Are there people sometimes who look at your job and say, 'no way that I could do that', and likewise to other people I might say, 'no way, I could not do that job'. And that I guess comes down to what your preferences are, in terms of what line of work you move on to.

There seems to be a trend to have more academic or scientific knowledge for evidencing social work practice nowadays (Nutley and Walter 2007), however, the boundaries towards other disciplines seem quite stable for practitioners:

Practitioner 1:

> I certainly think that medics have, are steeped, more deeply in science than social work is.

Interviewer:

> So, psychology does not count as a science?

Practitioner 1:

> No, I would say psychology counts as a science. I mean, what they have is what in psychology … one of the things when psychology becomes more sophisticated is statistics, right? But what underpinning risk assessments have is statistics, and the likelihood of certain types of behaviour, if x y and z factors are also present. So I think all the risk assessment tools we use are scientifically rigorous or based on statistics. There is that certainly. To go back to the biology or the neuroscience bit, I think I have a degree of understanding of that based on the things we talked about, so yes, my understanding of anger and violence is linked to science to a degree, but clearly you see that this is not particularly sophisticated.

It looks as if juvenile justice practitioners view themselves, or their knowledge, clearly as being distinct from 'science'. Here, science would also include psychology, as it seems to entail more 'factual' knowledge; for example, numbers and statistics. This divide of 'science' versus 'non-science' or here the practical application of social sciences (namely juvenile justice practice) versus neuroscience, leads to a picture of neuroscience that can cause intimidation – and as a consequence a need for a defence against it. This became particularly apparent in comments from practitioners who did not want to be interviewed by me as they read the term 'neuroscience' in my letter of information for potential interviewees. Practitioners who admit that they do not have an interest in sciences stated that they feel quite intimidated by 'neuroscience', and that they have no knowledge about it at all. After further questioning, it often appeared that they have been to training sessions, for example, about attachment theory, where neuroscientific knowledge was incorporated in training.

Practitioner 5:

> I don't think that I particularly know … I do not view myself as somebody having any knowledge of neuroscience at all.

Interviewer:

> What about brain development?

Practitioner 5:

> Well, attachment theory.

Many practitioners used the word 'intimidating' in the context of neuroscience. When the term ‘neuroscience’ was replaced by ‘brain development’ instead, they feel more relaxed and open about it.

Practitioner 4:

> I can remember when I was doing my training, when I was doing my undergrad before. We were particularly doing the brain and I used to partly find it fascinating but partly quite intimidating as well, as it did not seem all that real. And also, that scientific bit felt quite daunting. So it is not something that I have really … it would not be something that interested me during my training, put it that way. Or, there is a neuropsychology lecture on, or would you rather go to something else? I would have definitely not have gone to that neuroscience one, but I suppose when I think about it, I do find it really quite helpful in sort of conceptualisation of some of the difficulties that young people I work with quite often have.

Interviewer:

> Do you relate this to neuroscientific research?

Practitioner 4:

> I suppose, well that makes it feel really technical, and this is why neuropsychology was the kind of subject I was always shying away from a bit I suppose. But I think if you think about it in kind of terms of how somebody’s brain works, absolutely, because I think it is quite fascinating.

What we can see in these reflections is that practitioners feel intimidated but also fascinated. However, this intimidation does not apply to all practitioners or training providers. Practitioners with a personal interest in science and neuroscience use words like the 'amygdala’ and ‘frontal lobe' with ease, that shows a familiarity with the brain and some neuroscientific knowledge and terminology. However, this knowledge seems to be superficial and not very advanced. In the view of the practitioners, a more advanced knowledge does not seem to be necessary. This highlights the difficulties of transdisciplinary practice and discipline. How much

and how in-depth does theoretical knowledge need to be to work in juvenile justice practice? Is neuroscientific knowledge necessary for practice?[42]

If training providers therefore think it is relevant to convey neuroscientific knowledge to practitioners, they need to find a way to achieve this – even if there is a fascination with the topic. Otherwise, they might run into the risk that practitioners feel this knowledge is not relevant for their practice or feel that they will not understand the content:

> If I had to choose one session to hook someone, I would choose the brain development one. People suck it up … there is a huge interest, as long as it is well presented. I do not even understand how they make neuroscience so boring. It is absolutely fascinating but it needs to be presented in a way … it does not need to be complicated. […] I do not say how many would say that we have covered neuroscience. They would say that we have covered the basics of brain development. They would think what is happening in my brain, and what is happening in your brain. And they see all those neurons and how they all wire and fire, but I do not think that they are thinking that they are learning neuroscience in detail specifically. We obviously say this is the latest kind of neuroscience research but it is kind of slipped in. It is not really in lights that it is neuroscience. We do talk about other theories as well such as resilience, empathy and attachment to place things in context. The issue is do they change their practice? Do they have a better understanding why children might behave in a certain way? Why they as adults might behave in a certain way and as a result does that make them more empathic and better at supporting children and young people?
> (Training Provider 2)

This quotation also captures the interest and fascination neuroscientific research can present to practitioners. Therefore, for a successful neuroscientific knowledge utilisation, this needs to be done in the right format.

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[42] This also continues to be a topic in the theoretical literature which will be discussed in more detail in Chapter 9.

As established in the previous chapter, this is, for example, done through a specific discourse or by the use of images. As a result, the (intimidated) practitioner views this neuroscientific knowledge as powerful, valid and true. This can also be seen in the observation that Perry is seen as a 'guru'[43] who refers to 'facts' and the 'truth'. Slaby describes this process as follows:

> These trends are strengthened by the tendency that neuroscientific claims and explanatory patterns are often treated as authoritative—likely because of their alleged 'hard' scientific validity—even with regard to important normative questions in the domains of morality, ethics, and social policy. This happens despite the fact that many of the experimental results and their theoretical articulations are unstable and provisional at the current stage of development in brain research. (2010: 398)

It can be concluded that by the use of a 'vacuum', created by a feeling of fascination and intimidation towards this specific knowledge, the consequent use of a specific discourse and specific images support the establishment of unquestioned 'facts' and therefore a 'new truth' can be conveyed to practitioners. Although it can be concluded that neuroscientific knowledge is established as valid and 'true facts', a question remains: how this perception of 'hard' science influences juvenile justice practice? The following paragraphs therefore investigate this influence further.

2.2 Hope and Disappointment

Most interviewed practitioners mentioned the idea that neuroscientific knowledge provides hope. Practitioners hope for facts and knowledge, which might, one day, improve their work. The hope here is that with this knowledge and with these facts, better outcomes can be achieved with young offenders. This gives grounds to assume that these utilised neuroscientific 'facts' will lead to a knowledge-base that is true, supports practice and withstands criticism and additionally, reduces the

[43] Please refer to Chapter 7

ambiguities and uncertainties (White and Stancombe 2011) social work in children and families services entails.

Overall, practitioners seem to be interested in how that knowledge can shape and strengthen their day-to-day practice rather than neuroscientific concepts being often 'only' used to justify and strengthen observations or existing knowledge rather than providing new knowledge. The following quotation from the focus group with forensic psychologists reflects on this dilemma:

(Focus Group, Forensic Psychologists, Secure Unit)

Forensic psychologist 1:

> A few years ago I … was at the point at my training where I was looking for some sort of truth. I was so used to reading about theoretical explanations and aggression and anger and all that, I did think, oh, neurology, neuropsychology, that is the way forward, right? I am going to do that and will do a CPD[44] module with the University of Glasgow and children and adolescent neuropsychology, thinking here are all the answers. And I did it and you know what? It was disappointing, as there is not as much truth as you would maybe hope. Like any area of science, there is still lots of might-be-this-might-be-not: further research is needed. And you know, I suppose I did this a few years ago, whilst there is a lot of research out there that shows us links and all that, it was not as much as I was hoping for. You know what I mean? It was not as established […] no one has got the answers out there. And the thing that is possibly missing to me was saying, 'we know that experiences are kind of affecting the brain where it does not necessarily fully tell us what we then need to do'. You know what I mean? Whilst there is lots of research out there about trauma and neglect and the brain and everything, but maybe this is just lack of reading and knowledge, but the next step forward from that … 'and now we know, this is what we need to do' – it seems is not established yet.

Interviewer:

> And this is what you are actually looking for as practitioners.

[44] Continuous Professional Development

Forensic Psychologist 1:

> Yeah, exactly. As practitioners, that is the key thing, isn't it? Because the neglect and the trauma has already happened. Well, it is great for early intervention that knowledge, but in terms of intervention now after the event? And it just can be demoralising for people.

This reflection shows that there is a hope that neuroscientific knowledge can provide practitioners with the answers they have always looked for: 'How can we support young people to overcome their difficulties in an effective way'? However, the quotation also shows that aside from using this knowledge to explain and understand behaviour, the other important factor for practitioners is what kind of programmes and tools they implement, or refer the young person to, in order to promote change:

Interviewer:

> But what does that say about programmes and tools in practice? So let's say you have that picture of the brain and then you have the young people you are working with, so does that actually help your practice? Or does it just help you understand what is going on?

Practitioner 4:

> Well, I think it must help your practice, for your practice you must know what is going on. If you have in your head that this young person is choosing to act in this way or the young person is lazy, or whatever the label you want to put on, then you can only be frustrated with everything that is going on. It is not about you as a practitioner finding the right tools to help this person because you have figured out how they work or how their brain works; it is how to … you just want that person to change.

The above statement reflects the importance of this knowledge for the job and how it supports good practice but this practitioner was not clear how this knowledge actually supports the day-to-day job. Secure practitioners of a focus group were critical examining these limitations and how they view the impact of this knowledge on their practice:

(Focus Group, Secure Unit)

Secure practitioner 2:

> A lot of awareness is coming through, but in terms of practice this is somewhere off, I think. […] It is really really interesting and fascinating stuff. And it is really good to know that. But in terms of practice, we do not get kids coming in with brain scans. So how do we actually use the knowledge that we get? And how do we use it effectively?

Interviewer:

> So when you have done the training, why do you find it fascinating then?

Secure practitioner 2:

> I think, there is that … the basics of the brain, you know. It is about the brain is the driver of the behaviour and all that. And the aspects of emotions and cognitive development … it is always fascinating to get that wee bit of time to actually think about where the behaviours are coming from, some of the developmental backgrounds, issues that are there, trauma and these sorts of things. But […] I think the thing for me is that you can read through a lot of information that is fascinating, but then where do you go next in terms of practice?

Secure practitioner 3:

> It kind of helps you in a directional explanation why those behaviours are happening, from a sort of psychological point of view. But then, it kind of questions, when you sit next to, let's say John, how do you actually use that knowledge from a practical point of view? What do we actually do with this knowledge to help the young person?

Practitioners are hoping to find a specific new way of thinking about or having knowledge about the brain, which will help young offenders with their aggressive behaviour. It can also be assumed that practitioners feel insecure about their work with aggressive juveniles, as with some juveniles the existing tools and methods do not seem to work. As a consequence, they seem to be in desperate need for answers – methods, tools or explanations that go beyond what they already know. The image discussed in Chapter 7 seems to trigger the shift in thinking about young offenders:

> I have been to conferences, right. A practitioner or a researcher would stand up and say, 'draw a few pictures of a brain', […] this is a healthy brain and this is a neglected brain. And after coffee you could just hear people say, 'so what does that mean? There is no hope for our kids?' No, no, these are just pictures, you just try and all that. It can be almost … people can be seeing this as almost predictable. Well all right; then we don't. Which I do not think is true. You know?
> (Forensic psychologist 1)

The effect of this image has two sides as the quotations show: one side an increased understanding with more empathy, or as an explanatory framework[45]. It increases the understanding of the difficulties the young people experience in changing their behaviours and achieving change. However, it also seems to leave a feeling of unease with the practitioners as the question remains, how this proposed brain damage could be revoked. A training provider even used the word 'frustrating' in this context: 'I suppose, what is difficult about the Perry stuff is what to draw from it in terms of a strategy for helping. […] but that is what is frustrating' (Training provider 4). Although there is a feeling of unease, this knowledge could also be viewed as evidence for existing theories. Practitioners have agreed that the translated knowledge does not provide any 'new' direction with regard to hands-on practice in the context of tools and methods. However, this picture provides 'evidence' that these young people do not have the ability to choose to behave in the same way a teacher, another social worker or another 'healthy' or 'well-developed' child might do. However, this conflict can also be viewed as follows:

Interviewer:

> But what does that say about programmes and tools in practice? Let's say you have that picture of the brain and then you have the young people you are working with, so does that actually help your practice? Or does it just help you understand what is going on?

[45] Please see Chapter 7 for more details

Practitioner 4:

> Well, I think it must help your practice. For your practice you must know what is going on. If you have in your head that this young person is choosing to act in this way or the young person is lazy or whatever, the label you want to put on them … you can only be frustrated with everything that is going on. It is not about you as a practitioner finding the right tools to help this person because you have figured out how they work or how their brain works. It is how to, you just want that person to change.

Interviewer:

> So kind of a shift in perception?

Practitioner 4:

> Yeah.

This practitioner made the link between the explanatory framework and the lack of methods and tools provided by the knowledge: a shift in perception of these juveniles as somehow different or damaged compared with other 'normally' developed children and juveniles.

In his case study the influence of neuroscience on the treatment on personality disorders in mental health settings, Pickersgill's findings suggest mixed views by clinicians towards this knowledge: he categorises the responses in hope, doubt and resistance. The neuroscientific knowledge seems to be influential but with very limited scope on the understanding of clinicians on personality disorders (Pickersgill 2011). Similarities to his study can be seen in the factor of hope. Feelings of disappointment and frustration towards this knowledge seem to be more prevalent during this study compared with Pickersgill's results. Resistance (Pickersgill 2011) towards this knowledge could not be found during this study, rather intimidation of this perceived complex field of knowledge. Additionally, a further difference to Pickersgill's study is the result of emotions like disappointment and intimidation. Pickersgill did not find practitioners with feelings of intimidation. This might be due to the different professions, as trained clinical psychologists often study neuroscience, at least on a basic level, during their university degree.

However, this cannot be expected from social work practitioners as neuroscience, at least in Scotland, is rarely part of the social work degree. Additionally, in this study, a feeling of disappointment could be found in some practitioners, which again is not corroborated in Pickersgill's study. One possible explanation could be the fact, that due to limited basic knowledge of neuroscience, practitioners in juvenile justice are less realistic and more hopeful towards this new knowledge and the possibilities neuroscientists have.

It can therefore be summarised, that in the view of practitioners and training providers, the 'brain damage', in the young people practitioners are working with, has already happened. Their interest mainly lies in the questions around how they can change that and help the young people to move on. An often-asked question during these interviews was: 'So what?' Practitioners value the additional knowledge this research field provides for their better understanding and as an explanatory framework. Similar to Pickersgill, however, no evidence could be found that neuroscientific knowledge is used to change practical approaches or tools:

> While the findings of neuroscience research may well be interacting with existing professional understandings of personality disorders, this does not appear to be translating into substantive shifts in the organisation of work at the clinical coalface. (Pickersgill 2011: 461)

For practitioners, and also for training providers in juvenile justice this seemingly results in a disappointment that this knowledge actually might not be able to provide the necessary answers to practice. And so they are left with the question of what this knowledge can actually provide to improve their work.

In conclusion, some practitioners sometimes feel disheartened by the often worrying future perspective the young people have they are working with, which is represented in the images which seemingly refer to neuroscientific findings. Practitioners' practice focuses on improving the lives of the young people by

reducing their offending behaviour and acts of aggression and violence. Their main interest, therefore, is to find methods and tools that work. Here, the concept of neuroplasticity ('malleability of the brain') supports their practice. Although they might find the neuroscientific research knowledge interesting, they have often stated: 'So what?' and: 'Is there a tool or programme based on neuroscientific knowledge I can use?' The interviewees mentioned these limits of the translated knowledge regularly. It can also be established that there is a tension between intimidation, hope for new insights and advanced methods and tools, and a disappointment that they are not delivered by neuroscientific research. Additionally, some practitioners seem to have moments when they feel insecurities about their work as current methods and tools occasionally do not seem to have an effect.

3 The construction of the 'traumatised and 'brain-damaged/impacted juvenile'

Chapter 6 establishes the construction of aggressive behaviour across the disciplines. The construction of aggressive behaviour in juvenile justice in Scotland is based on theories about emotional regulation and literacy, attachment theories and trauma-related developmental difficulties. It is now important to examine how juveniles who display this socially unwanted behaviour are constructed in the context of juvenile justice practice to reflect on the influence of neuroscientific knowledge.

One of the findings of this dissertation is that there is a conflict between provided tacit knowledge and the current lack of 'new' and 'advanced' methods and tools

derived from this knowledge. The effect of this conflict in the tension of intimidation, fascination, hope and disappointment on the influence of neuroscientific knowledge on the view of juvenile offending, and how this affects the attitudes of practitioners, now needs further investigation.

The view of children as maltreated, neglected, deprived, troubled and so forth, and therefore the construction of childhood and children has a long history in social science (Hill and Tisdall 1997; Corsaro 2005). For this context the development of the concept 'traumatised' seems to become the focus of attention:

> Then I guess in terms of your own field, whether you got things like Bruce Perry kind of stuff around brain development around hyperarousal, around not always having the capacity to respond to situations without being aggressive and I think that there is more and more coming about that. […] I saw a piece in a paper, maybe 2 months ago, that looks at brain of a young person who had been through all manner of abuses and stresses as an infant as compared to another young person who had a normal existence and the brains were just not comparable. Just very very underdeveloped. And at that point you wonder to what extent can somebody be held responsible for their behaviour if that is how things have worked out.
> (Practitioner 1)

Although the term 'trauma' is usually not clearly defined when practitioners or researchers use it, the conclusion achieved with this knowledge is that there is damage caused which goes beyond what we know from the psychological theories (for example, behavioural or cognitive theories). These psychological theories have established the impact of loss, bereavement, negative relationships, lack of nurturing care and different forms of abuse on the development of a child and its ability to develop its full potential in life (Bandura 1977; Weisaeth 2002; Kolk and Roth 2005; Salmond and Meiser-Stedman 2011; to name just a few). Neuroscientific research has now focused on the damage that has been caused on the brain, for example, through researching the effects of physical or emotional trauma on the

brain (Perry 1995; Schore 2001; Hutterer and Liss 2006; Bremner 2008). This might then result in brains that are somehow 'different' to the brains of children who develop without the impact of trauma.

A practitioner referred to neuroscientific knowledge he uses in his practice as follows:

> I guess neuroscience for me is that picture of the brain with the frontal lobe and the cortex and the amygdala and all the rest of it. And generally when you read something, it will talk about how that particular part of the brain may be […] less well developed with the kind of young people we work with or somewhat more defective or underdeveloped. And that is kind of where you draw the line, because for me going into the next layer of that is beyond my day job.
> (Practitioner 1)

The result of this knowledge shows a view of young offenders as having a deficit of some form in the brain. This quotation also shows that neuroscientific research is influencing practice and the way practitioners or training providers think about and view these young people in their work. The statements show that the knowledge is used to increase the understanding of young people's behaviour. The explanation here is that they cannot choose how they behave based on the different developments of their brains, and consequently the impact this had on their attachment behaviours and emotional regulation. The impact of trauma-focused explanations seems to increase due to the neuroscientific research findings. As a consequence of trauma, children and juveniles are not as much in control of their behaviours as other children who do not offend due to a somewhat 'different' brain. What can be seen here is the establishing of a 'traumatised brain' of juvenile offenders, which leads to a feeling of hopelessness on behalf of the practitioner. What can be done, when this child's brain is so damaged? Do practitioners actually have any chance to promote change at all?

In Chapter 7 neuroscientific knowledge was established as an explanatory framework for parents and other professionals, whereby the blame for the negative behaviour is shifted from the child, juvenile or parents to the brain. The neuroscientific knowledge and its derived theories clearly enforce the idea of the impact of trauma on the brain of young people. The question remains, however, are all children who end up displaying aggressive behaviour and needing support from a statutory juvenile justice team, children who have been abused, neglected and traumatised? Clearly, this is not the case. Some children develop this behaviour due to peer pressure, or because they are bored or because they test their boundaries as a natural process of growing up (McAra and McVie 2010). However, this was not the focus of the interviewees. The majority of interviewees concentrated on traumatised, neglected and otherwise 'impacted' children and did not refer to wider ecological or social circumstances. Hacking stated:

> The word [trauma] used to denote physical wounds, injuries, or lesions, but now it denotes a kind of mental event in the lives of people – the psychic wound, forgotten but ever active. We did not know that we had them until recently – or, more paradoxical but more true, they were not a possible kind of experience to have had. But surely trauma, in its present sense of psychic wound, has been a permanent fixture on human life? Only in the past century has it been a human kind, i.e. a kind of experience about which scientific knowledge is claimed. Only recently has it become a self-evident link between rape, infant seduction, shell-shock, and being held hostage by terrorists. (Hacking 1995: 369)

Of course, it is not denied that some of the juveniles the interviewees spoke about have experienced terrible or difficult things in their past. It is, however, of importance to note that there is a generalisation in the conceptualisation of aggressive juveniles observed: aggressive juveniles are referred to in the context of (brain) trauma. There is no established routine in juvenile justice practice in Scotland whereby service users' trauma is assessed through specific psychological tests like, for example, the post-traumatic stress diagnostic scale (Foa 1995) or the Trauma Symptom Checklist for Children (Briere 1996). Even the assessment of

attachment difficulties is often not based on a formal diagnostic test. We can, however, assume that these aggressive juveniles are assessed in the form of background and family histories where experiences like neglect, physical or emotional abuse usually come to light. The term trauma is used loosely. It is never explicitly defined what kind of difficult events this term includes and how often these events have to occur for a juvenile to be referred to as 'traumatised'. This is a difficulty, which can be found in the literature as well: the definition of trauma is often not clear and therefore leads to a generalisation of the complexities[46].

The knowledge provided from neuroscience and through speakers like Bruce Perry, for example, focuses on research about events and 'trauma', which cause a deviation from 'normal' development. This might then result in aggressive behaviour and attachment difficulties. The 'traumatised brain' is part of the perspective of how practitioners view aggressive juveniles. On the other hand, a training provider speaks about the same issue in a different way:

> But at the moment I think the information is helping us, to get a message out that I think is a good message about children, about some of the children that we are working with – about what they had to deal with, about how they have developed coping strategies that kept them alive when they developed them, but they are now dysfunctional in this children's home or in this school. Or now that they are 8, or now that they are 14. But when they learn those things, when that behaviour became hard-wired as a neuro-pathway, it was the behaviour that kept them alive. That is what they are going to refer to every time they are under threat, every time they are triggered.
> (Training Provider 1)

This statement tries to develop an understanding of the child's development of coping strategies based on the brain development, which explains current behaviour

[46] Please see Chapter 7.

to enhance empathy and understanding of the practitioners: 'At the moment, it is helping us to speak to the unconverted' (Training Provider 1). This training provider is very clearly admitting that the knowledge is useful to change attitudes and beliefs about young offenders or children with challenging behaviour.

> So, that is out there. And so there is some resistance to that line, to the idea … if that kid … I guess what you are saying to people you can do something about this. You can change the way you work and he will change his behaviour, and […] depending on the way you receive information, you might think that that translates into you are trying to say that this is my fault. And again, there is a bit of that. We are saying to people, the environment has an impact on behaviour. Your relationship has an impact on behaviour, the way you talk, the things you say, will definitely have an impact on how this child is behaving, and we need to use that positively.
> (Training Provider 1)

Particularly staff in secure units have pointed out that a better understanding and, subsequently, different approach towards the young people has resulted in less restraints and more productive and successful interventions. A different understanding and perspective on certain behaviours always results in a different perspective on the concepts of this behaviour: The above image can also be seen as a symbol for the shift in thinking that the neuroscientific knowledge might have in the area of juvenile justice: young offenders are viewed differently with this image in mind, as the message clearly states that they are different from non-offending (or non-abused/traumatised) children.

Here, this means that the neuroscientific knowledge translated into practice suggests that there is only one truth in respect of these complex problems, how children develop into adults and how they are raised 'most successfully'. The knowledge takes part in the establishment of aggressive juveniles as 'traumatised' and therefore as 'brain-damaged':

> Even in the absence of empirically established models of most psychiatric disorders, there is a confident assumption that the brain holds the key to explaining mental disorders and ultimately, to their cure (Kirmayer 2012: 380).

There was a readiness of acceptance and enthusiasm when some of the interviewees spoke about neuroscientific knowledge. This particularly agrees with Hacking's and Slaby's (Hacking 1995, 1999; Slaby 2010) statements of a 'critical practice', as there does not seem to be an embedded or established critical practice in juvenile justice's practice to examine the used scientific knowledge before it is applied and implemented. Farmer refers to this as follows:

> The consensus is that positivist disciplines, like those involved in neuroscience, yield explanations rather than understandings; they produce causes rather than reasons. Positivism is highly successful and useful precisely because it is designed to exclude classes of understanding, like meaning. (Farmer 2009: 39)

This criticism of the establishment of neuroscientific 'hard' facts has also been raised by Cohn in the field of mental illness, whereby a new self-understanding of the patient in the context of his or her illness is found with the support of brain scans. As a consequence, the illness is somewhat objectified (Slaby 2010). In juvenile justice practice, it is not so much the readiness of the clients to integrate this knowledge into their self-understanding, but the readiness of the practitioners to integrate this knowledge into the assessment and conceptualisation of aggressive juveniles.

The development of the 'dream factory' (Slaby 2012) is supported by a lack of criticism towards a more positivistic approach to knowledge, the use of a specific discourse to establish 'facts' in combination with feelings of intimidation,

fascination, hope and disappointment. In the context of 'hard science' versus social work, this problem becomes even more apparent.[47]

Compared with the results of this study, Pickersgill findings might suggest a more critical view on neuroscientific knowledge by mental health clinicians than by juvenile justice practitioners. However, Pickersgill also concludes that:

> A more critical appraisal concerning the promise of neuroscience might be required: a re-evaluation of funding strategies that takes into account the gaps between science and practice and the sociotechnical factors (co)-producing these, as well as the ways in which the utility of neuroscience is a function of the (perceived) ontology of psychopathology. (Pickersgill 2011: 461)

The establishment of 'traumatised' and 'brain-damaged' aggressive juveniles as social realities seems to enter the world of juvenile justice practice in context of this complex influence of neuroscientific knowledge. This therefore means that there appears to be an observable trend towards a more 'medicalised' or 'biologised' view of aggressive juveniles (Abercrombie and Hill 2000; Threvithick 2008).

It has been concluded above that practitioners often seem disappointed by the lack of new methods they have been offered by this knowledge. Hacking provides an example about the construction of alcoholism and its consequences; he differentiates between the model established by a moralistic and a medicalised or biologised view. The medicalised or biologised view results in a view of alcoholics as having a disease, which they are not responsible for, and a clear method or regime to treat it similarly 'to the way someone with high blood pressure follows a regimen' (Hacking 1995: 373). So, here in the context of aggressive juveniles, practitioners

[47] A summary of a critical theoretical discussion about the distinction between natural and social science and arguments against this distinction can be found, for example, in Smith and Best 2002.

have expected exactly this: a regimen that can be followed in the 'treatment' of this unwanted behaviour. Neuroscientific knowledge is therefore supporting the construction of aggressive juveniles from the perspective of a medicalised or biologised view. This is also suprising, as neuroscience offers another interesting way of looking at young people in trouble: the ability to change due to the malleability of the brain. However, this was not the focus of the interviewees.

Practitioners have already started to raise concerns about the impact of this knowledge on their work in the context of pictures of the 'damaged brain': how they actually can overcome this when there are no 'new' or 'advanced' tools developed through this knowledge. This passive attitude towards knowledge seems surprising: it appears that they expect factual and theoretical knowledge and, at the same time, they expect knowledge that is already advanced and transformed into useful strategies, tools and methods. It seems practitioners – and to a certain extent training providers – portray themselves as passive 'uptakers' and learners of the work of other professions or professionals; they seem to expect someone else to develop a 'treatment' based on neuroscientific knowledge that can provide a 'cure'.

The other interesting point here is that aggressive behaviour is now seen in the context of broader theories, such as attachment theory or brain development and the impact that has on the behaviour of a child.[48] Aggressive behaviour is not seen solely as an anger management problem, which can be treated with certain anger management techniques or with physical power and restraints. The acknowledgement of practitioners and training providers, that aggressive behaviour is more complex than just described, has probably been influenced through these more complex and more general theories. These are in turn sometimes influenced by neuroscientific research. The resulting conceptualisation of aggressive children or juveniles here is, therefore, based on theories concentrating on development and

the influence of the outside world, and is found in terms like 'traumatised', 'damaged', or 'de-regulated'.

'Impacted' or 'damaged' brains are then the consequence of this (brain-) development. Although various professionals stated that they do not get brain scans of the juveniles they are working with, the awareness that this young person has a somewhat 'different' brain is mentioned in the reflections on aggressive juveniles. We can therefore conclude that there are two parts of the axes of social construction of aggressive juveniles, which appear as a consequence of (neuro-) scientific knowledge: traumatised juveniles (as *cause* part of the axes) and 'brain impacted or damaged' (as *result* part of the axes).

As established, this knowledge is useful to stress the importance of early intervention (on the cause part of the axes). This also has a negative effect, here described as 'disappointment', on the attitude of practitioners who work with children who are much older than 0-3 years (on the affect part of the axes). So it can be concluded that this knowledge has an impact on the attitude and as a consequence on the approach of aggressive juveniles, but this happens more on a tacit level. Here, these considerations are important to keep in mind, as policy influences juvenile justice practice to a great extend. The link to an ideological/political agenda of using neuroscientific knowledge in the context of a welfare approach is particularly interesting and is explored over the next subsection.

3.1 Neuroscientific knowledge and a welfare approach in juvenile justice practice

The Scottish system is built on the philosophical assumption of the welfare

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[48] Please refer to Chapter 6.

Approach, whereby the offence or the socially unwanted behaviour is always seen in the context of the broader picture: the upbringing and the social world he or she lives in influencing how a child develops. It is therefore no surprise that in juvenile justice practice in Scotland, brain development, trauma-informed and attachment theories are used to explain that aggressive behaviour is a result of early experiences within the family home or certain trauma that happened during childhood (usually abuse and neglect). Neuroscientific knowledge is integrated into overarching theories, which are applied to practice and taught by training providers and consultants. These are based on psychological theories and concepts that stem from particular views of how to best raise a child. They are based on a certain understanding of childhood as well as on concepts based on welfare ideas and 'the best and most productive citizen'. As a consequence, aggressive juveniles are seen as 'traumatised' and '(brain-) impacted or damaged'. The following paragraphs explore how this construction of young people is instrumentalised to influence the policy process.

Although Hacking does not count violence or aggressive behaviour as a 'human kind' (1995: 374), the social science of criminology or juvenile justice plays a role in the establishment of the looping effect and it is therefore important for practitioners and training providers to be aware of their construction of this behaviour. According to Hacking, today, the process of constructing people, or 'making up people' includes scientific classifications, which can be influenced by neuroscience (1999). However, it is not only classifications that 'make up people', it is also the knowledge distributed and used in practice. A training provider stated that:

> Certainly trauma-informed care has made a huge influence on our service. Attachment models are critical and we are trying to promote an understanding that the attachment history for the children we are looking after is very important. That their understanding of the relationship they are having or any relationship is fragile and that this might be damaged by a

> model that places behaviour control on top of the agenda. And the more we were trying to force control, the more we were keeping ourselves at a distance. And whatever fragile attachment and relationships and bonds staff are making with these children, give your mind an introduction to these controlling behaviours, so we are trying to move more to nurturing and being supportive. And particularly nurturing relationships and seeing the relationship as the main agendas of change in a child's life. Without that relationship the child is not going to accept the influence of adults. And there is that real difficulty, the more we try and assert control, the less control we are likely to have because the relationship is kind of hampered by our effort to control. And the more you relinquish and let go of that control, the more influence you start to have and the more control you finally actually achieve. But it is difficult for staff to let go of that. It is really challenging … a lot of cultural values. Referee of justice … the foundation, building block of western European society and getting people to let go of that desire to take and eye for an eye and a tooth for a tooth and be fair and just … and instead become rather more gracious and forgiving. It is to let go of a cultural drive … difficult. (Training Provider 6)

Apart from establishing the importance of attachment theories for practice, this quote also highlights the dilemma the juvenile justice system and practitioners are in when working with the young offenders with aggressive behaviour: the conflict between control and nurturing in order to promote change and to keep everyone safe at the same time. A welfare approach and also the (neuroscientific) concepts that practitioners use when working with these young people influence this conflict of control and nurturing. One practitioner has worked in a secure unit in the United States of America where a more punitive approach to aggressive juveniles (Bishop and Decker 2008) is used and stated the following when comparing the approach she has experienced there to the approach in Scotland:

Interviewer:

> So what is your approach to aggression, what is it for you? How do you deal with it?

Practitioner 10:

> I think verbal de-escalation is the first and I think it starts with having a rapport with kids. Because it is easier if a kid has a relationship with you – I think then they are less aggressive. That is first of all. Then second of all,

getting to a point when they are really aggressive, I have not had to come across that here. Only once, but that was not directed towards me, that was more self-harm when she was headbutting the wall. So it was not really aggression towards anyone else apart from herself. So whereas in the states, you were dealing with aggression all the time, they were in fights and it seemed like they did not have as much remorse as the kids here. So it was not like here, when they were in a restraint, they would headbutt or they did not really. I do not know if that was maybe a connection but I do not know, it was very different. And a lot more dangerous over there than here.

Interviewer:

So do you think that staff over there have a different way of dealing with aggression or have a different attitude towards it? And that has an impact on the whole atmosphere and how the children then behave?

Practitioner 10:

Yeah, because I think there are very quickly restrained.

Interviewer:

So they do not use as many de-escalation techniques then, is that it?

Practitioner 10:

Yeah. In the States, you get training on verbal de-escalation and get a … CALM[49] training, a bit like here, and they are quicker to restrain. And I do not know if it is the type of people working there as well. When I first started it was a very diverse group of workers but then in the end it was a lot of very big African American males … so really strong, and in the end … I think in my last months I was working there, I was the only white female working. So they just wanted big strong men to basically control them. And I think that is the thing, there is a lot more control there. So I think that made them more aggressive whereas here, they are locked up but they have more freedom and choice. And choice is a big thing. So you can teach them to choose the way they act.

According to this practitioner, the theories influencing practice do not only have an impact on the day-to-day practice; for example, the use of de-escalation techniques and restraints. They also have an influence on the kind of people who are employed or seek this employment with the purpose of fulfilling these roles of

[49] CALM Training: Crisis, Aggression, Limitation and Management

power and control executing these concepts (for example, in the form of physical superiority and the use of physical restraints). Therefore, the construction of aggressive juveniles through the used knowledge has an impact on various levels (for example, from the political level down to the day-to-day practice). During the data collection process, a training provider stated:

> I guess, the thing about the medication is interesting. Bruce Perry, you know, always talks about … not using medication. And his model, I cannot remember what it is called now, but this model of kind of basically rebuilding the brain or kind of going back and putting in the building blocks for certain pathways, is a model that is all to do with pattern and repetitive experiences, and it is not about medication [please see Chapter 7]. Yeah, but I can see that there might problems there with that. […] maybe that is in a slightly different sphere from the kind of sphere we are in. I guess that there can be difficulties with anything in that respect. […] it is a big responsibility to have this information. You know, […] we have to act. It is a bit like the guy […] … that discovered dynamite, something like that. He might have discovered that for some good reason and then it was used for bad reasons. And so it is, yeah. I guess, we maybe do not to think about that. But I do not know, at the moment it is funny. I was just having a conversation with [name of a colleague] yesterday, where she was kind of saying, if we are getting to a point where we kind of saying, no wonder that these people are kind of behaving like this because of their history, and their trauma, and their neglect and the neuropathways or lack of, their ability to work or operate in certain ways, where does crime and punishment fit in there?
> (Training provider 1)

This suggests that this knowledge can be instrumentalised to establish certain perspectives and views in the context of control, nurturing and punishment. It is therefore no surprise that this knowledge is used in arguments about funding and early intervention, as it seems clear that this knowledge supports arguments for resources that help prevention of these 'unwanted behaviours' or now, with the construction axis in mind, prevention of these 'traumatised' and 'brain-damaged' children and juveniles. An often seen image is the following, which compares the capacity of brains for change with the cost of programmes that are used to intervene if change is necessary, because people access mental health facilities, substance

misuse programmes and education programmes or are services users in juvenile justice programmes.

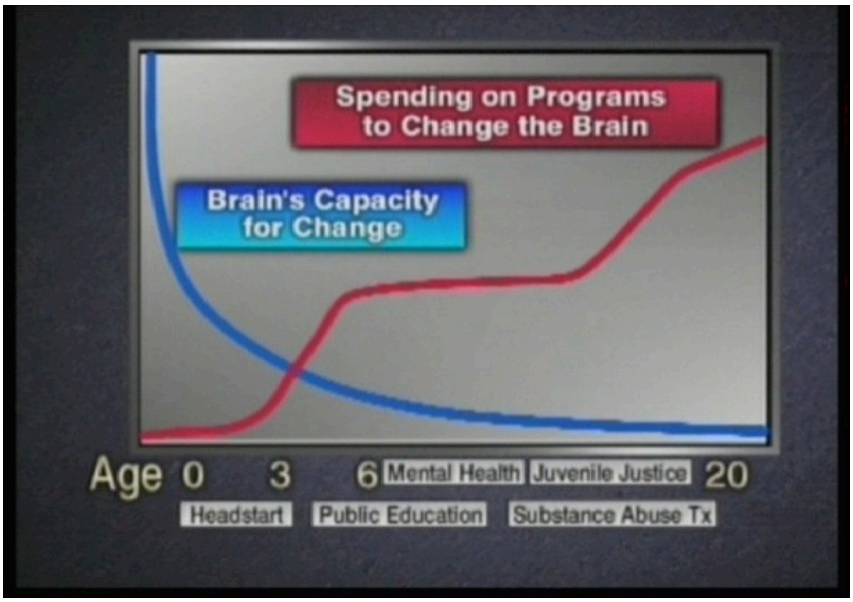

Image 9: Brain's capacity for change: the spending cost for programmes to achieve change (Wavestrust 2008: 15)

The above image is regularly cited in this form or similar. It is used to establish the relevance of early intervention to prevent young people and children developing as 'cost-factors' for society. Additionally, it helps to promote early intervention programmes to prevent harm. In the report published by Wavetrust the following text describes the image:

> The picture strongly suggests that an investment fulcrum lies in 'primary prevention' focused on 'at risk' groups under the age of three. Primary intervention stops a condition from developing in the first place: putting it very graphically, if dysfunction and violence were polio, primary prevention would mean administering the Salk vaccine to everyone at risk rather than waiting to see who developed the symptoms. (Allen and Smith 2008: 47)

There is no reference made to the statistics behind this image, or how the capacity for change of the brain was established. However, what we can see here is that by using 'brain development' or a so-called 'capacity for change' in the

context of costs for society, a powerful message can be conveyed to the public: Early intervention functions like a vaccine. If we do not administer this, we risk children becoming aggressive and criminal, drug users, mental health services users when they are adults, and so forth. So they are not 'great kids' and 'good citizens'. Bruer calls this

> the basic infant-determinist premise that the Myth now attempts to present as a 'neuroanatomical fact'. The Myth rejects strong genetic determinism in favour of strong early neural-environmental determinism. (Bruer 1999: 206)

For example, a conference of 'Flourishing Infants in Fife' offered by Fairer Fife in February 2011, was accessible for social workers as well as health practitioners. Speakers like Dr. Suzanne Zeedyk (The University of Dundee) and the Chief Medical Officer for the NHS, Dr. Harry Burns, spoke about the negative impact of stress on the developing brain of children and babies. The citations used here include early intervention concepts, promoted by Wavetrust[50]. Although this is not directly related to juvenile justice practice, it gives an example of how neuroscientific knowledge is used to promote agendas for early intervention, which, according to the image above, will have an impact on juvenile justice services in future. The image gives a very clear message that this neuroscientific knowledge provides the evidence that we need to invest in early prevention programmes to avoid brain damage later on in the life of these children:

> And they all talk, like, […] 'we know now that a secure attachment in the early years can help with brain development, and we know about that'.
> (Training provider 1)

This quotation interestingly shows how the use of this knowledge is phrased: 'We know now'. Neuroscientific knowledge appears to solidify the knowledge we have about children, their upbringing and how attachment shapes people and so forth.

This is not to say that early intervention does not have benefits or should be disregarded, however, it shows how this neuroscientific knowledge or the use of the words like 'brain development' are used to sell a message. Bruer (1999, 2001, 2012) deconstructs these political and policy debates in his publications and calling it a 'myth':

> Note also that for the most part, the authors and papers cited in the mid-to the late 1990s are the same authors and papers being cited in current policy reports. The same over-generalizations and over-simplifications that appeared then are appearing now. The evidentiary base for claims about early brain development does not seem to be expanding, the interpretations are not improving, and the same examples, phrases, and images constatly recur. (Bruer 2012: 11)

The consequences these myths have for the debates and subsequently for the practice within children and families settings are described by Wastell and White as follows:

> The co-option of neuroscience has medicalised policy discourse, silencing vital moral debate and pushing practice in the direction of standardised, targeted interventions rather than simpler forms of family and community support, which can yield more sustainable results. (2012: 397)

The other aspect would be about the political implication that has, or might have, when the trend of focusing on psychological and neuroscientific knowledge, or a more medicalised and biologised view of aggressive juveniles shifts to support arguments. One training provider raised concerns that other important reasons for the development of this behaviour might be pushed into the background or out of focus. An example here would be the influence of poverty and community, which has implications for the understanding and basic underpinnings of social work values.[51]

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[50] http://www.wavetrust.org

[51] Please also refer to Chapter 7

It seems that some training providers and practitioners are aware that there is a potential for ethical and wider political implications of the use of this knowledge, and as a consequence, the 'looping-effect' (Hacking 1995). It does not seem to be part of their self-understanding of their role as practitioners or training providers to think about the consequence of the construction of aggressive juveniles as 'traumatised' and 'brain-damaged or impacted'. The question remains, who, in the context of knowledge translation and knowledge use, has this responsibility?[52] However, this starts to go further:

> I have been asked a lot more about the neurobiological stuff in court. How does this work? How might a baby be affected? How might a baby's brain be affected by being in the middle of domestic violence?
> (Training provider 4)

This statement shows that there starts to be an interest for this knowledge in court settings: this training provider is also an expert witness in court for children and families cases.[53]

Through the reduction of aggressive juveniles as 'brain-damaged or brain impacted', other theories, social learning for example, are pushed into the background. Although Perry (2008) establishes his theory as a model that goes beyond the medical model and includes wider theories like attachment theory, the construction of the 'brain-damaged' juvenile is doing exactly this: the creation of a juvenile with some form of brain damage or impact reduces the perspective on the juvenile. This however, seems to be in contrast to a welfare approach that includes wider aspects of development and adverse life situations.

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[52] Please see Chapter 9 for further reflections on this question

[53] Please refer to Tovino 2007; Freeman 2011; Pickersgill 2011

4 Conclusion

This study has shown that neuroscientific knowledge, used as an explanatory framework, can be seen in the context of hope, fascination, disappointment and intimidation. Practitioners have feelings of intimidation and insecurity in the face of existing practice. However, they also feel and know the limits and the importance of the work they are doing.

There is a notion that neuroplasticity supports practice and the idea of change which includes an increased understanding and more empathy. It also improves the understanding of the difficulties the young people experience in changing their behaviours and achieving change.

This provides a feeling of hope that there might be a 'cure'. On the other hand, it leaves a feeling of hopelessness. There is a clear image of the damage that has been done and there is a lack of methods that might help revoking this development: it can be concluded, that there seems to be a tension between the effects the neuroscientific knowledge has for practitioners – by providing a feeling of hope and offering a useful explanatory framework – in contrast to a feeling of disheartening evidence which destroys the hope and questions the basis of the work. Additionally, there is a disappointment that there is no 'miracle cure' method to retract these developments. This tension seems to be resolved by picking and choosing which knowledge is translated and by choosing when the knowledge is useful and when it is disregarded. However, currently, the use of this knowledge for hands-on juvenile justice practice is limited.

The powerful image proposed by Perry (1997)[54] can be seen as the start of a process of a shift in thinking. It can be used as a reflection of the positive effects. However, it also highlights ethically critical aspects this knowledge might have. Examples here would be questions concerning the plasticity of the brain and the ability to change when a child's brain is underdeveloped as a consequence of trauma and abuse. By drawing on the work of Hacking (1995, 1999) and Coudhury and Slaby (2010, 2012), it has been established that neuroscientific ideas are easily incorporated in a system which is based on a welfare approach, whereby early intervention and understanding of young offender's life history are key to promoting change. Theories of the impact of trauma and the resulting damage on the child's brain are readily incorporated in the day-to-day practice. Therefore, aggressive juveniles are constructed as 'traumatised' and 'brain-damaged or impacted'.

However, the reductionist perspective on aggressive juveniles as 'brain-damaged or impacted', and therefore a more medicalised or biologised perspective, stands in contrast to a welfare approach which incorporates ecological as well as social perspectives on the development of adversity. What can be seen is that knowledge is used to promote certain political agendas in the context of early prevention. There is a danger that if this knowledge is not reviewed and critically examined by practitioners for the context of their work, this might allow policy changes (for example, more punitive approaches or a further reduction of funding) or a possible development towards medical treatment of traumatised/aggressive juveniles.

The different recognised feelings towards neuroscientific knowledge might provide an interesting tension for discussion that leaves room for the establishment

[54] Please refer to Chapter 7

of new attitudes of practitioners and training providers towards theories that derive from other disciplines to further establish transdisciplinarity in the future.

The next chapter explores the technical side of the knowledge production and utilisation with a specific focus on a professionalisation of practice in a context of transdisciplinarity.

9 Knowledge-for-Practice and Professionalisation of Practice

1 Introduction

The following chapter discusses knowledge-for-practice in the context of this study. The involved actors as well as the term 'evidence-based practice' and its meaning for practice and knowledge utilisation are investigated. Additionally, adaptation, reduction and modification of neuroscientific research findings are discussed. It is argued that training providers, and to a lesser extent practitioners, take part in the production of a 'practitioner's neuroscience', whereby Gibbon's concept of Mode 2 knowledge production (Gibbons 1994) is applied. A specific focus is placed on the concept of a professionalisation of social work practice through academic or scientific knowledge in the context of social work as a 'transdisciplinary science'.

In order to complete the investigation of the 'technical side' of the knowledge utilisation and production process, it is now necessary to examine the role of the key actors in this process.

2 The actors involved in knowledge production and utilisation

The important actors in this process are scientists in laboratories, key scientists, knowledge entrepreneurs and training providers, and here, to a lesser extent, colleagues, newspapers and other media where neuroscientific knowledge is distributed, and also scientists. The focus of the interviews was on two groups of this process: practitioners and knowledge providers, and forensic psychologists.

2.1 Juvenile justice practitioners

All of the practitioners regularly attend Continuous Professional Development (CPD) sessions, where some of the trainings concentrate on administrative and legal issues, others on protocols, guidelines and computer systems. Other training is specific to aspects of their work, for example, on attachment theories.

Additionally, some practitioners stated that they read articles and have discussions in team meetings about certain research topics. However, the majority of the practitioners stated that they are too busy in their day-to-day job to look for research or to read articles. One interviewed manager stated that they have a slot in the team meetings once a month to present research findings to the team; however, this was stopped as people were too busy and caught up in their casework to continue this regularly.

Interviewer:

> Where do you get that specific knowledge from? Is that something you just look up yourself or get through colleagues?

Practitioner 5:

> Yeah, … partly reading that I am doing myself, and partly if there is training, well, SAVRY for example. I did not go to the formal training on that but I did do the reading around it. And you do a couple of assessments and you build on that sort of knowledge yourself, [name of colleague] has been really supportive to me […] … she has been in youth justice a lot longer than I have and her knowledge is … I use her quite often. And there was, for exampl, the attachment course, but a lot of it is informal, like I said. And you read around a subject if you are interested in it or if you have a specific client where you think 'I must do some reading on that particular type of behaviour' or whatever – you try anyway.

The majority of the interviewed practitioners stated that the main source of knowledge is training, personal study based on their own interests, and peers and colleagues. However, some practitioners also advised that the budgets for training have been reduced over the past years and therefore the overall attendance of training sessions and conferences has decreased.

Interviewer:

> So where to you get the knowledge about aggression and violence from?

Team manager 1:

> Some of it is from the training … we get trained by a forensic psychologist in terms of using risk assessment tools. We have internal development meetings where members of staff are given slots once a month, and a member of staff is given a one-and-a-half hour slot to lead a discussion about professional development research that comes out, or if they have been to a conference where a member of staff gives feedback on the conference … anything that generally means up-to-date professional practice. May have guest speakers come in for example … might say we make this slot available to [name of a researcher] or yourself or somebody like that to tell us about research.

2.2 Training providers

As discussed previously, those training providers interviewed were heterogeneous. The majority of the interviewed training providers have experience of being a

practitioner. The source of the knowledge that gets delivered and translated is summarised by one of the training providers as follows:

Interviewer:

> So where to you get the knowledge from?

Training Provider 2:

> Books and articles, It just about [different books and writers like] 'Tracing the roots of violence to the nursery', 'Why love matters', 'Mindset (Carol Dweck), 'The brain that changes itself' (Norman Doidge), 'Emotional intelligence' (Daniel Goleman), […]. I mean they have all done the job of putting together all the research. Every so often, we go into the journals. We will, where we want to query something in a bit more detail … we will go back to the journals but otherwise, we will cite bits that are there.

Interviewer:

> So some kind of pre-decision has already been made about which knowledge is actually useful and valid and true?

Training Provider 2:

> Yeah, exactly. I suppose, all the conferences and all the speakers and all the kind of heavyweights here (for example, Dr. Helen Minnis, Dr. Suzanne Zeedyk and so on). You hear about their research at conferences and stuff like that. So it is a mixture of both.

Interviewer:

> So how do you then actually simplify that really complex knowledge?

Training Provider 2:

> Well, I suppose it helps that we are lay people in that field in the first place. I just think, … you need to make sure that the facilitator knows it, and can reference everything, so everything is referenced, so if they need to, they can go and read the reference. But actually, you just have to … … it is not so complicated really.

This statement shows that speakers or researchers pre-sort research they present to practitioners at conferences or publish in books and journals. There does not appear to be a systematic review of, or an approach to, the theoretical or neuroscientific literature or research at the level of the training providers. Statements like this

suggest, that the practical experience of the training providers, their previous knowledge and their belief systems influences which knowledge they present to practitioners. This is also supported by the following statement where this training provider reflects on the training they receive about knowledge they deliver:

> In terms of training for us there might be some specific kind of psychological conference that we might go to or I am thinking about the Jane Island stuff down south. I used to work in the prison service in the specific science delivery programmes where we would get training and things like that. But in terms of, specific for us, I can't think of much out there.
> (Forensic psychologist 1)

Although training providers deliver training according to related policies and practice, the emphasis that they choose to put on the content of the delivered training seems to be in their hands. 'Knowledge entrepreneurs' do not seem to act on decisions from management or policy in respect of the knowledge they spread; they choose themselves which knowledge is relevant to be transported. Knowledge providers or entrepreneurs have a powerful role as a consequence of this. Based on their personal interest or background education, they promote this knowledge to the practitioners and use published books and key scientists as their knowledge base.

Nutley presents a differentiation of research use in practice: research-based practitioner model, embedded research model and the organisational excellence model (Nutley and Walter 2007; Davies 2010). The research results from this project suggest that the research-based practitioner model is the most useful model in this context: it is the responsibility of the individual worker or training provider to decide which research results are used and implemented in their day-to-day practice (Davies 2010). Here, it is also important to emphasise that training providers also choose the source of delivered knowledge, often unsystematically. Politicians or policymakers in the government do not seem to have an influence on

this as it appears that this process rather works the other way around: the transported knowledge the knowledge entrepreneurs develop and deliver, influences policymaking through a changed or changes in practice. Here, training providers seem to influence practitioners as well as policymaking in their 'sandwich' position.

During the interviews, it seemed that these knowledge entrepreneurs appear to have a much broader knowledge of neuroscientific research than the interviewed practitioners. As a consequence, they give the impression that they think that neuroscientific knowledge can help to shift views and perspectives in a more general way. This, in turn, will have an impact on thinking, policy and resource provision and will possibly offer knowledge for new tools or programmes. The argument is that this change in thinking will then eventually change practice. This means that from the point of view of the training providers, the influence of this utilised knowledge would be experienced in a systemic way rather than at an individual level:

> I deliver training to different groups of staff across the department where attachment and brain development are core parts of the training. My emphasis is therefore on giving front line staff a different way of understanding challenging behaviour. The hope is that if the behaviour is 'understood' differently, it may be dealt with differently – i.e. more empathically, less coercively etc.
> (Training Provider 1)

It can be concluded that training providers have a key role in the knowledge production and utilisation process and therefore influence practice in juvenile justice and how it is shaped in the long term.

3 Theoretical knowledge and juvenile justice practice

Over recent years, the trend to evidence-based practice has increased (Nutley and Walter 2007). Additionally, there is now a requirement for a recognised professional registration of the individual worker within the social care workforce by the Scottish Social Service Council (SSSC[55]). A professional social work qualification through an undergraduate or a postgraduate degree was formalised in the UK in 2003 (Blyth 2009; Orme and MacIntyre 2009). In Scotland, the law now protects the term 'social worker'; that means the title can only be used by registered social workers. Practitioners registered with the Social Service Council have to undertake a certain amount of training days per registration period for their registration to continue. Additionally, there is a trend towards more accountability as well as measurability of interventions in social work practice (Healy 2005). We can therefore conclude that there is a trend to 'professionalise' social work practice. This trend can be observed in various other countries, too (Kornbeck 1998; Weiss-Gal and Welbourne 2008).

In the context of professionalisation of social work practice, part of the discussion is the question of which knowledge belongs to the professional knowledge base (for example, Kornbeck 1998; Gambrill 2001; Hanses 2007; Weiss-Gal and Welbourne 2008; Blyth 2009). The relationship between social work theory and practice continues to be 'closely interrelated' (Parton 2000). Therefore, the debate about a professionalisation of social work practice and its increase of theory and scientific knowledge does not come without opposing arguments: it is questioned how much academic knowledge is necessary to work in this field. . On one hand, workers need practical skills, which include, for example, to build
trusting relationship with clients and service users and offer them support. This can sometimes be viewed as more important than an academic knowledge base

(Sheppard 1995; Askeland and Payne 2001; Healy 2005). And, as Schoen states: 'Even when he [the practitioner] makes conscious use of research-based theories and techniques, he is dependent on tacit recognition, judgements and skilful performance' (1999: 50). Clark (2011) calls this the practice or professional wisdom: 'It [evidence-based practice] cannot give us much help in developing the skills to apply general precepts to particular moments and cases' (Clark 2011: 59). On the other side, we can find an increased expectation with regard to theoretical, scientific and academic knowledge social workers are required to have to fit into modern expectations of the profession: 'The stage of scientification/academisation is no necessary pre-requisite, yet commonly thought of as the 'hard core' of professionalisation (evidently because of the added prestige it gives)' (Mueller 1993: 39). The question here, therefore, is: what counts as evidence for practice?

3.1 Evidence-based practice

Professionals working the field of juvenile justice in the UK have been trained in evidence-based practice. Additionally, they have to provide a portfolio proving their abilities to work to these standards in order to be recognised and registered by the Social Service Councils. In social work services, knowledge transfer has become more and more important over the past decades (McGuire 1995; Nutley and Smith 2000). At the same time, the policymaking process has been more influenced with knowledge (Hudson and Lowe 2004). In practice settings, previous knowledge (for example, established through obtained degrees or personal interest) as well as daily pressures of the job influences the way policies are implemented. This knowledge also impacts on decisions concerning the use of tools and methods (Hill 2005). This also is reflected in the phrase 'evidence-based practice', as according to McNeece and Thyrer, it includes 'the integration of the best research evidence with professional expertise and client values in making practice decisions' (2004: 9).

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[55] http://www.sssc.uk.com

Assessment tools in juvenile justice practice are now part of the day-to-day job of social workers and psychologists as well as psychiatrists. Assessment tools are usually developed to provide a scientifically-based or evidence-based practice for planning interventions as well as being a basis for the decision making process and risk management strategies. Personal preferences as well as local habits strongly influence the use and the understanding of assessment tools. In the context of accountability, there is a trend in Scotland to standardise practice (Scottish Government 2002; CJSW 2011). It is argued that a standardisation of practice gives more transparency, accountability and validity to interventions.

On the other hand, some of the interviewed practitioners stated that they are not encouraged to use evidence for their practice. They do not get any guidance from their management regarding the use of evidence-based practice. Additionally, their workloads are too high to undertake practice that is based on evidence: this requires reading, looking for research and keeping up to date with the latest developments and taking part in training sessions and attending conferences. It therefore seems that evidence-based practice is a concept, which has not been established in practice as much as it is talked about in politics and policymaking. In the context of evidence-based practice and the 'best practice agenda', a social work training provider stated:

Interviewer:

> So how do you decide what knowledge is valid, useful and true?

Training Provider 5:

> I test it against my own. What I find … well it is pretty crude, really. Well, we all go round and say what do we think? Would that help, has it helped, is it helping? So you do the Dan Hughes stuff and you find it does help even in the stuff that I am doing, makes it more immediate, more fresh, more real. It is a useful technique, so you want to share that with people.

The social work training is less focused on scientific content, and practitioners do not feel that this is necessarily a disadvantage:

> I mean, I think any assessment tool is as good as the person using it. And as good as the training they had in how to use it. I would assume in making an assessment tool that psychiatrists or psychologists will be effectively trained in that tool. Will they have greater capacity to understand it, as in to understand the knowledge that underpins each question? Possibly, because that is their area of interest and study of many years. I think that there is a limit to how many tools you can master and that we have focused on social work specific tools. If there were questions that I was uncertain about or there were assessments provided by a psychiatrist that I did not understand, you would aim to raise that with them and ask them to give a clarification of what that means or what this is about.
> (Practitioner 1)

The term 'evidence-based practice' does play a role in the understanding of most interviewed practitioners of what is viewed to be 'good' practice. However, most practitioners admitted that they rarely have the time to look for new research, and if they do, it is only to gain tacit knowledge rather than to provide a conscious rationale for their practice. This confirms a statement by Munro: 'Studies of social work practice show that implicit use of theories is more common than an explicit use' (Munro 1998: 98). This issue has also been highlighted in various other publications and studies (Howe 1987; Munro 1998).

On the other hand, in respect of using risk assessment tools or specific methods that are established in social work practice, one practitioner stated the following:

Interviewer:

> Do you know if any of the tools and programmes you use are evidence-based or based on science of some sort?

Practitioner 4:

> I think so, I mean I do cognitive assessments, and I suppose that is using the WISC or the attachment that is hugely evindence based I suppose. The

> risk assessment that is SAVRY … I suppose, again, evidence based. I would think, more than a few years ago there is definitely more of an evidence base … you feel that you really have to be accountable for … and you have to be able to evidence what you are saying.

As there is no automatic process in practice to refer to the evidence base of a used method or tool, here, in the quotation the practitioner 'thinks' or 'supposes' but is not completely convinced. Not all practitioners know if the tools and methods they use are evidence based:

(Focus Group, Forensic Psychologists, Secure Unit)

Forensic Psychologist 1:

> It is kind of a theme there, like attachment trauma … and to what extent is there a clear model that is evidence based and all that that can be applied. And to what extent is it just folk throwing these terms around to explain stuff and say, 'well it is trauma you know'. And I think, I suppose as a team we try and keep it to quite close parameters on that and talk about measuring it and what not. Whereas other areas of the service … it is just concepts being thrown about.

Interviewer:

> So do you think that is because your training is different to other professions? That you take care to use the specific parameters before you use this terminology?

Forensic Psychologist 2:

> We are more forensic focused, we are looking at the different problems and that is something we would consider whereas I know that sometimes attachment and trauma, just as you say about Bruce Perry stuff, there are a lot of people where this is just outwith their competency but they think that they are attachment experts.

Forensic Psychologist 1:

> I totally agree. I think part of our training is about you do not swallow anything until you have seen the science, you check the reliability and validity, that is just core to psychology, isn't it? And without that you are in danger, like practice based I think. But I don't expect that from other workers to be honest because that is not necessarily part of their role. But it

> is a really big part of our role to critique things. Whereas it is maybe not as big a part of the training of other people.

What can be observed in these quotations is a different attitude: it is assumed that evidence-based practice is a relatively new term in social work settings and therefore is not as ingrained in practice as it is, for example, for psychologists or doctors working for the NHS (National Health Service). The approach of evidence-based practice in medicine (Sackett, Rosenberg et al. 1996) and also in psychology (Spring 2011) has a long history and the guidelines and protocols seem to be more rigorous. Developed by NICE (National Institute for Excellence) in England and accepted by the NHS Quality Improvement Scotland, one example here would be the 'Management of PTSD in adults and children in primary and secondary care' (National Institue for Clincal Excellence 2005)[56]. There is no such equivalent for juvenile justice practice, which is applied by all practitioners and institutions.

It has to be made clear, that not all practitioners share the same understanding of 'evidence-based practice'. For example, for writing reports for the Children's Hearing System and court reports, it is common practice to write without any citations and references. Evidence is classified, for example, in court reports where evidence is based on police charges, medical records, and incidents of domestic abuse, child protection investigations and interventions of professionals. It is not common practice for practitioners to cite research papers in these reports. Additionally, practitioners rarely undertake literature reviews or other academic activities to underpin what kind of knowledge they classify as 'scientifically valid'. Some training providers have made similar statements as discussed above.

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[56] Some points of discussion about benefits and downfalls of this (rigorous) approach to evidence-based practice can be found, for example, in Clark 2011, Gambrill 1999; McGovern and Fox 2004; Melnyk and Fineout-Overholt 2005; Waldron and Turner 2008; Gray and Plath 2009; Turner and Green 2010.

It is, therefore, necessary to differentiate this hierarchy of evidence (namely theories, research evidence and knowledge and legal evidence) in the understanding of evidence-based practice for juvenile justice settings. What can be concluded here is that the terminology of 'evidence-based practice' seems to have different meanings. It cannot be assumed that all practitioners in the field of juvenile justice practice are basing their neuroscientific research knowledge on robust, scientifically examined research.

(Focus Group, Forensic Psychologists, Secure Unit)

Forensic Psychologist 1:

> I suppose you have different roles, haven't you? And one is not necessarily better than the other. But I would say part of the definition of our role is evidence based and maybe that is not such an important part of the social work role, do you know what I mean? And there's different strengths to each position, isn't there?

Interviewer:

> But that makes it maybe more vulnerable to theories that just sound nice where there is no evidence to it.

Forensic Psychologist 1:

> But that also means that theories can create steam and collect evidence, so that evidence generating stuff. But, like you said, the cost of that is that you could use stuff that is hokum.

This quotation from the focus group highlights two important points: one is that there needs to be a forum where evidence can be collected to establish, share and discuss new methods and theories in practice. However, this is rather difficult in settings where only methods and theories based on strict guidelines and certifications can be undertaken. The other point is that this bears the risk that theories and methods are used and spread which might not be scientifically valid.

During the interviews, an interesting pattern emerged in the way interviewed (forensic) psychologists approached the subject of science compared to the social work practitioners: 'Psychology 1.0.1, … you evaluate what you are doing. And without that, want to sign up to it, really' (Forensic Psychologist 1). Later on during the interview, the same forensic psychologist explained this approach to evidence-based practice as follows:

> As a forensic psychologist, the key thing is that we are evidence-based practitioners. So no matter how much celebrity or no matter how nice the theory seems, I think that we would be at risk of undermining our profession if we don't go with the evidence.
> (Forensic Psychologist 1)

How practitioners view this knowledge is based on a passive uptake, rather than an active knowledge seeking. Or, as Healy states: 'In short, the social worker is the subject and user of knowledge, not the maker of it' (2005: 99). The difference between academic social work expectations and practical social work can be seen here (Healy 2005). The reasons for the lack of initiative in practitioners being active knowledge seekers can be summarised as: lack of time and resources, a different perspective on 'knowledge', their own understanding of the role of a social worker and last, but not least, a sometimes 'intimidated' view of (neuro-)science.

The previous paragraphs have established that evidence-based practice and training provision are different in practice than discussed in political debates. The question remains, how much scientific knowledge do juvenile justice practitioners need in order to make judgements about which knowledge they use?

> To go back to the biology or the neuroscience bit, I think I have a degree of understanding of that based on the things we talked about. So yes, my understanding of anger and violence is linked to science to a degree, but clearly you see that this is not particularly sophisticated.
> (Practitioner 2)

This practitioner is clear that the level of scientific understanding he has is very basic, but he feels that this is enough in order for him to do his job; particularly, because neuroscientific knowledge is only incorporated in theories and knowledge in use in juvenile justice, as other knowledge also informs theories and knowledge. The question that arises is what is a critical perspective in this context? Practitioners make decisions about knowledge based on what is useful for their practice. How can they implement this in their day-to-day job and how it does support their work so that it becomes 'knowledge-for-practice' (D'Cruz 2009)? This confirms Askeland and Payne's theory (2001) about the relationship between professional and scientific knowledge. Namely, that scientific knowledge supports and validates practice, which is gained from other life-domains and professional experience through testing and refinement.

It could also be established that the critical perspective of practitioners is not necessarily based on scientific or academic reasoning. Firstly, this is not their field of expertise as they are practitioners, not researchers. Practitioners have usually been trained to a limited extent in critically examining the different theories during their undergraduate degree as well as social research methods. Nonetheless, it appears that practitioners do not view this as part of their role. Secondly, in their day-to-day job, it is only relevant to have knowledge that supports their work with their clients. As established in Chapters 7 and 8, the focus is on the practical implications of knowledge and theories. Practitioners might not think that neuroscientific knowledge is relevant ('so what?') or useful and, therefore, it is not analysed in more depth. Alternatively, they might remember the concept and the overarching idea that derives from specific neuroscientific knowledge without knowing or remembering the details. This has also been observed by, for example, Healy (2005) and Munro (1998) in their studies on knowledge in social work services.

3.2 A lack of training specifically for the topic aggressive behaviour?

As concluded in Chapter 6, aggressive behaviour in one form or another plays a role in the working life of juvenile justice practitioners on a day-to-day basis; either in the form of indirect aggression (through acts of service users allocated to the practitioner) or in the form of direct aggression towards the practitioner. Consequently, aggressive behaviour needs to be assessed or reacted to regularly. A hypothesis that practitioners get specific training on this topic in order to professionally deal with it could not be verified:

(Focus Group, Forensic Psychologists, Secure Unit)

Interviewer:

> Do you think there is enough training on aggressive behaviour and violence in the field?

Forensic Psychologist 1:

> You are making me reflective here. When I think about the training we deliver, we do a lot of training on sexually harmful behaviours … staff want to know about this. We do stuff on ADHD and autism, but nobody ever says: 'Can we get training specifically on aggression?'

Forensic Psychologist 2:

> There is a short course that we provide as an intervention on anger management, but again it is actually called strategies rather than what is behind the behaviours and what theory and so on.

Forensic Psychologist 1:

> I suppose it is maybe broken down a lot into anger, trauma or all the different aspects that contribute to the behaviour a little bit rather than aggression.

Interviewer:

> So you think that stuff that people should know gets delivered; just not in this specific format?

Forensic Psychologist 1:

> There's maybe different routes to it, isn't there? You know, I think about the holding safely model. That might be called restraint in another setting. I don't know … talks a lot about trauma and how that can cause crisis and can lead to aggression and talks a lot about crisis cycles and emotional cycles. Really, what the key thing is, is the aggression but it is not necessarily under that umbrella.

Forensic Psychologist 2:

> Yeah, I think you are probably: right it is more bits and pieces rather than bringing it all together in one training on aggression.

Interviewer:

> So do you think that people on the ground actually have enough knowledge to deal with this kind of stuff?

Forensic Psychologist 1:

> I suppose that depends on where your threshold lies, right? So there is a lot of stuff out there that is fantastic stuff we need, but you give them some kind of exam where you try and seek out their knowledge on aggression … it might not be that high. So they might not know the theory behind it, but they might have the skills to deal with it, because they have just learned it elsewhere.

Forensic Psychologist 2:

> It definitely depends. It is about the experience they have and the competences they have and develop. And it also depends on the kind of boys that come into the units, you know. Sometimes they are more difficult and there is more aggression and violence and anger.

This discussion during the focus group shows that there is not one specific way of learning about aggressive behaviour as a practitioner. It also shows that there is no explicit training on this topic, but aggressive behaviour is usually part of other training sessions. Overall, most of the interviewees have said that they would appreciate more specific training on aggressive behaviour as they feel that there is a gap and they feel that they have a lack of knowledge in this field. Most practitioners also admitted that they have never thought about this before. Yet, reflecting on it highlights various aspects, which would be important for them to know for their practice. Aggressive behaviour is something they are confronted with in one form or

another each day during their work. These reflections highlight the tension between the need for academic knowledge and practical skills and expertise, which are a core part of the debate of the professionalisation of social work (Sheldon 1979; Sheppard 1995). However, although we can observe this tension here, most of the practitioners would welcome more academic knowledge on specific topics related to their work if their employers supported this.

Aggressive behaviour has been chosen to reduce the amount of neuroscientific research knowledge available for practice and to therefore enable a better analysis of the knowledge translation process. Although the knowledge translation process of knowledge about the boundary object of aggressive behaviour can be traced and investigated, the knowledge utilisation process of neuroscientific knowledge can be seen in a more general context. The key actors in the process, and the way knowledge is transported and utilised, are not specific to knowledge about aggressive behaviour. This can be particularly observed as neuroscientific knowledge about aggressive behaviour is utilised in the form of general concepts on child development and emotional development and not in form of specific knowledge about the boundary object itself. It can be assumed that this process is similar for practitioners in other children and family settings of social work services.

A question remains, however, of how the issue of knowledge transfer is resolved in the context discussed in this study. The next subsection therefore discusses this process of knowledge transfer and production: how neuroscientific knowledge is transferred, exchanged and utilised in practice in the context of evidence-based practice and a professionalisation of juvenile justice and social work practice.

4 Knowledge utilisation, transfer and the use of 'reference points'

Firstly, the concept of knowledge relevant for juvenile justice practice needs to be examined closer.

4.1 A practitioner's neuroscience

The previous chapters have shown how practitioners and training providers conceptualise neuroscientific knowledge by examining the boundary object of aggressive behaviour. Aspects of neuroscientific knowledge were followed from neuroscientific publications and studies to broader theories. In this part of the process, scientific knowledge starts to be adapted and changed and integrated into broad theories. Knowledge entrepreneurs then transfer these theories to practitioners who then use certain aspects of this knowledge in different functions in their day-to-day work with service users, parents and other professionals. Here, the process of adaptation and utilisation is important, so that 'scientific knowledge' becomes 'professional knowledge', or 'knowledge-for-practice' (Trevithick 2008).

Of course, part of the process of providing training is to design courses and lessons with a focus on the audience: the interviewed training providers have been clear that particularly the way neuroscientific knowledge is presented needs to be done in the right format. This is mainly due to the lack of background knowledge about neuroscientific concepts, but also due to the intimidation practitioners feel when confronted with this type of knowledge. This means that the language needs to be adjusted, and complicated or factual knowledge needs to be put in a context that relates to the day-to-day work of the practitioner. Images as well as language play a crucial role in this process (please refer to Chapters 7 and 8). The process of

providing this type of knowledge to practitioners therefore involves a form of exchange, and neuroscientific knowledge or research findings are customised to meet the needs of the audience. This study has shown that academic or scientific knowledge in the area of neuroscience is adapted and transferred to a form of 'practitioner's neuroscience'. And here, if this neuroscientific research knowledge supports existing practices, theoretical assumptions or frameworks, it is a welcomed addition and validation of other existing theories. Additionally, this study has shown that practitioners rely on knowledge translators or knowledge entrepreneurs to make the complex neuroscientific knowledge understandable and accessible for them. The result is that this knowledge appears detached from academic neuroscientific knowledge and builds a 'practitioner's neuroscientific knowledge'.

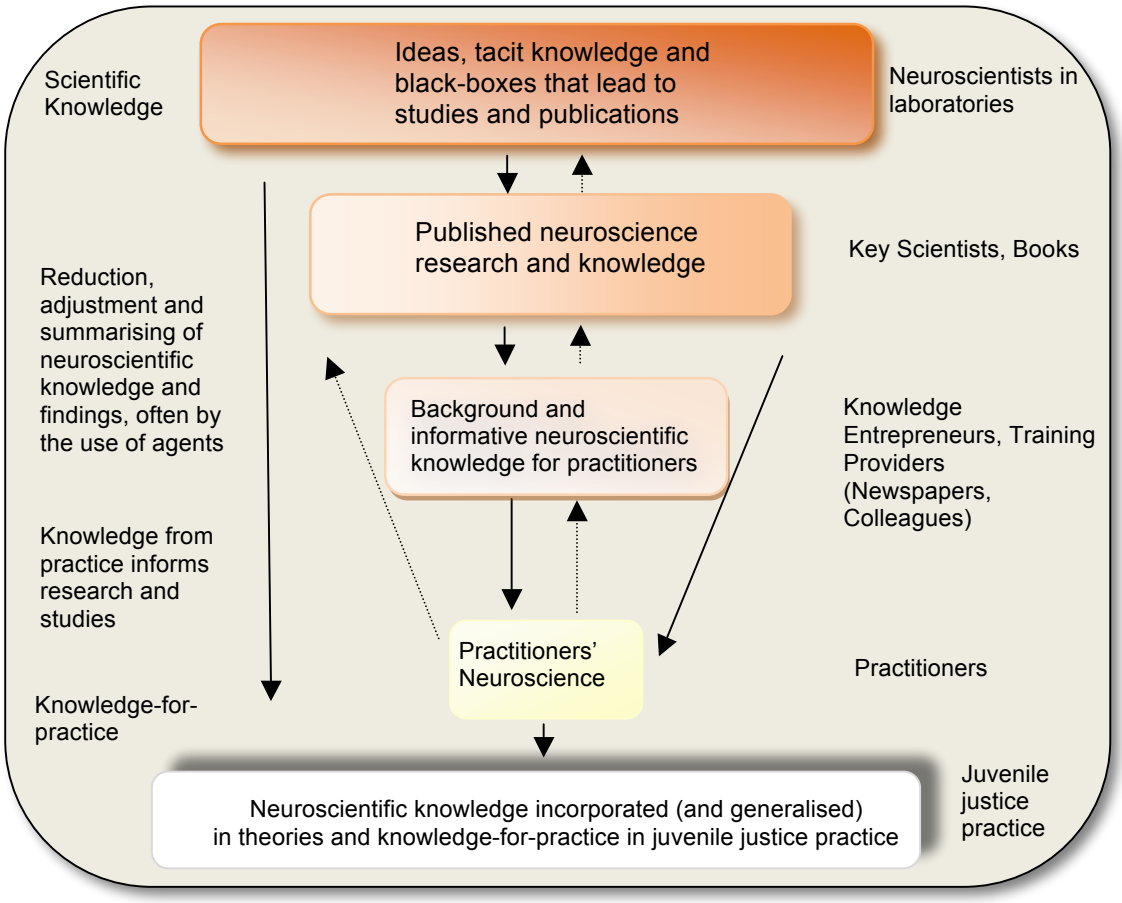

Image 10: The utilisation of neuroscientific knowledge from research to practice

The image above shows the process neuroscientific knowledge undergoes from the laboratory to its use in juvenile justice practice. What we could also see is that practice and practical experience influence neuroscientific research and knowledge, at least to a certain extent (Chapter 7). This process of knowledge exchange takes place in both directions, though the emphasis seems to develop from research to practice. After neuroscientific knowledge has undergone the process described above, this knowledge appears changed and shaped compared to the original knowledge from the laboratory as a 'practitioners' neuroscience'.

Finally, the practitioners then incorporate this knowledge into their wider knowledge base, often in the form of tacit knowledge. All neuroscientific knowledge translated into practice is based on a 'pick-and-choose' approach and limited to specific aspects, which are useful for practice and understanding. The pick-and-choose manner refers to the fact, that some aspects of neursocientific knowledge have been transferred to practice whereby other aspects, which could also play a role for day-to-day practice, have not been utilised by practitioners or training providers. For practitioners, familiar theories like attachment and trauma theories, theories on child development as well as images take on the role as agents in the transfer process.[57]

4.2 The use of reference points and transdisciplinarity in practice

Furthermore, neuroscientific knowledge used in practice appears to be negligible. Neuroscientific knowledge in practice seems to function as points of reference based on simplification and extraction of complex scientific research findings rather than complex knowledge translation. The process of simplification of scientific knowledge, practicularly relevant for the applied social sciences, has been observed

[57] Please refer to Chapter 7 and 8

by other authors with other scientific domains (Fleck 1979, Taylor 2004, White 2011, White and Stancombe 2003).

The key actors in this process include neuroscientists in the laboratory, key scientists and specific books, knowledge entrepreneurs and training providers as well as other materials and colleagues, and then finally the practitioners themselves.

In order to define this process, the term 'knowledge translation' and 'knowledge transfer' needs to be examined more closely:

> The metaphor invoked by these terms is, at best, one of gathering and integrating evidence from research, condensing this into convergent knowledge, and neatly packaging this knowledge for transfer elsewhere. More often, it simply implies the dissemination of relatively undigested findings from single studies. In other words, knowledge parcels for grateful recipients. (Davies and Walter 2008: 189)

It has been established that this is not the case here: reference points used by training providers and practitioners are extrapolated, reduced and adapted to the day-to-day practical applications of practice. Kunnemann (2005) argues that the form of 'knowledge production' investigated here is 'Mode 2'. This concept fits better than the concepts of knowledge transfer and translation. The specific knowledge on aggressive behaviour is shaped and changed and incorporated into broader theories of child development. Therefore, a form of knowledge production takes place, which goes beyond the classic academic knowledge production (Mode 1).

The concept of trans- and interdisciplinarity was criticised by various authors (Hessels and van Lente 2008). Nonetheless, Büchner (2012) argues that social work can be called a transdisciplinary profession in Gibbon's sense. Additionally, neuroscientific research is, in itself, multidisciplinary. The concept of

transdiscipline, however, goes beyond this: 'Once theoretical consensus is attained, it cannot easily be reduced to disciplinary parts. Additionally, the research results difuse (to problem context and practitioners) during the process of knowledge production' (Hessels and van Lente 2008: 741). Following this argument, the concept of transdisciplinarity can be applied to the way neuroscientific research findings are used as reference points and incorporated in the day-to-day practice. In order to be incorporated into broader theories, experience and cases from practice need to be used to verify and apply this knowledge. This was shown in Chapter 7, for example, by the way Perry uses neuroscientific findings in his concepts of trauma-related effects on brain development. Here, the concept of reflexivity (Gibbons 1994) and 'social accountability' (Hessels and van Lente 2008) play a role, too. This means that wider implications of this knowledge are considered, and the production of knowledge includes a dialogue between various different stakeholders. Here, training providers play a more important role than practitioners as they seem more involved in the process of adjustment, extrapolation and reduction of this knowledge than practitioners are.

The question of what is basic and what is applied science in Gibbon's model is a complicated one and is criticised by various authors (Stokes 1997, Weingart 1997, Hessels and van Lente 2008). For the context of this study, however, it is likely that certain kinds of neuroscientific research, for example, on a cellular or molecular level fit into the category of Mode 1 knowledge production. Here, the application of this knowledge seems clearly distinct from the research. Only later in the process of knowledge production does this mode change to Mode 2. This differentiation of the process, where the two modes of production are included, solves this complexity for this study.

As the knowledge, which is transferred or translated into juvenile justice practice appears to be fairly limited at the point of this dissertation; this process is referred to as knowledge utilisation process rather than knowledge translation or transfer.

5 The integration of different areas of knowledge towards a professionalisation of juvenile justice practice

After discussion of the knowledge production and utilisation process, it is now important to examine how the knowledge from neuroscientific research can be incorporated into knowledge-for-practice in the context of a professionalisation of practice. As stated previously, various different disciplines influence juvenile justice practice. During this study, it was shown that holistically oriented theories about child and brain development theories influence theories about aggressive behaviour. Farmer has developed this model in the context of an overenthusiasm and under-enthusiasm she observed by social workers accepting neuroscientific knowledge and has developed a 'transaction model' (Farmer 2009). This model is useful for the context of this PhD: it gives a different perspective on the uptake of this particular knowledge as it verifies certain aspects explored during the data analysis. Hope and disappointment, as the attitudes towards this knowledge[58], work well with the concepts of over- and underenthusiasm suggested by Farmer. The transactional model is certainly valuable to give social workers a different perspective on the diverse areas of knowledge they might find useful to integrate into their practice. Farmer refers to a critical perspective towards natural science or neuroscience in particular: 'It suggests the desirability of social workers preparing themselves with a basic understanding of philosophy of science so that they can manage this kind of overenthusiasm' (Farmer 2009: 39). However, this model does

not stress the importance of a critical view about the different types of knowledge in the context of an evidence-based and professional practice.

Arguments and theories, which strengthen welfare ideas, seem to be welcome by practitioners. Here, this means that (neuro-) scientific theories in support of the idea of juvenile offenders being in need of support rather than punishment, children being formed by their experiences in their family and community and the importance of the relationship to the parents for the developmental process of a child are referred to in this context. The trend to speak about 'we know now' and 'we have the evidence to back up these claims' has been observed in most interviewes throughout the data collection process. From the analysis of the interviews, it can be concluded that although certain theories find a higher impact or uptake amongst practitioners, in general this is done more or less uncritically. There seems to be a personal preference for knowledge, which is embedded in personal beliefs, attitudes, previous training and knowledge, and experience. Nonetheless, the importance of ideologies, established beliefs and terms like 'hard science' should not be underestimated in this process. The trend to use psychological rather than sociological theories – and thus risking a perspective on aggressive juveniles as 'brain-damaged' – needs to be carefully considered by training providers and practitioners. The establishment of practitioner's knowledge remains a complex and very individual process. Yet, in the context of professionalisation of social work practice, this might just not be enough:

> Improving service quality provides a second reason for developing our capacity to identify, use and build theory in practice. Theory allows us to critically examine common-sense ways of seeing and doing things (Thomson, 1995, p. 28). Thus theory can enable us to critically review assumptions and accepted ways of doing things that work for the disadvantage of service users. In this way, theory can enhance our capacity to explore a broader range of

[58] Please refer to Chapter 8

> practice options than would be evident from a common-sense viewpoint. (Healy 2005: 95)

If practitioners accept and use neuroscientific knowledge for practice without critically reviewing its source and validity, they only *appear* to have theoretical knowledge. This is also valid for the critical examination of the underlying principles and philosophies, this knowledge entails. It has been observed during this study, that there was a non-participation of practitioners in the knowledge production and utilisation process through an uncritical and passive uptake of this knowledge:

> The non-participation of practitioners in the debate about, and the development of, formal knowledge means that the profession is denied insight from a broad range of practice perspectives. Of course, practitioners do use and create knowledge in practice, but, by and large, this knowledge work occurs informally and remains in the heads of the individual practitioners, or at best is transferred orally through supervision. (Healy 2005: 96)

Therefore, if practitioners continue to be passive up-takers of this knowledge, this process is left to other actors or professions, for example, psychologists or to training providers. Additionally, the full recognition as a professional workforce with a specific knowledge base becomes harder and less achievable. This is particularly relevant as there is also a trend to employ more, less-qualified workers for social work positions (Healy 2005). Here, a different attitude towards the use of academic knowledge by professionals could help to maintain and develop the profession. Or, as Flyvbjerg argues: 'But scientism in social science is self-defeating because the reality of social science so evidently does not live up to the ideals of scientism and natural science' (2001: 168). Within a world where evidence-based practice and an 'academisation' of the profession are prominent, it is surprising that practitioners are not more involved in the critical examination of new knowledge and, consequently, Mode 2 knowledge production. Here, the conceptualisation of 'natural science' or 'neuroscience' (for example, the view of neuroscience as being

'intimidating') by practitioners and training providers might play a role. Nonetheless, in order to professionalise social work services further, it is also relevant to integrate the concepts of professional or practice wisdom (Clark 2011, Dunne 2011) as social work practice is not possible without the ability to build relationships, react to unexpected situations, and use knowledge in the practical context and so forth.

A question arises, how the concept of transdisciplinarity can provide a perspective for these dilemmas. Büchner summarises the concepts of Kleve and Obrecht[59] as follows: Kleve understands transdisciplinarity as a scientific endeavour which already co-ordinates different theories. Obrecht, on the other hand, understands transdisciplinarity as an ambitious future goal for social work as he sees transdisciplinarity as a consequence of an integrative application of science. Additionally, Kleve includes practitioners in the knowledge production and transdisciplinarity aspect, whereas Obrecht leaves this aspect with the international community of social work (Büchner 2012). It can be concluded that within juvenile justice practice and the influence of neuroscientific knowledge, Obrecht's concept of transdisciplinarity seems to be a better fit in this context: the uncritical use of reference points from neuroscientific research for practice seems far away from a co-ordination of different theories (Kleve) and therefore can only be an ambitious future goal (Obrecht).

It has been shown in this study, that a critical examination of theories or neuroscientific research findings with a specific focus on practical implications is necessary, so that knowledge is used in responsible and effective manners and leads to an enhancement of practice. In a world of a professionalisation of practice, it seems that a critical examination of the utilised knowledge needs to be part of the knowledge utilisation and integration process: What does this *theory* or research

[59] Kleve 2000, 2003; Obrecht 2003

finding really mean for our practice? What does this *theory* mean for this specific service user (for example, is he or she really traumatised and/or 'brain-damaged')? What does this mean for our relationship with our service users and their parents, and what does this mean for the way we work with our clients differently to before? What kind of perspective does this *theory* provide on our clients and service users? By accentuating the word 'theory', it becomes clear that this is a certain view or perspective that might change again in the future and is a form of vehicle to explain certain phenomena as we view them today. It even might incorporate that different theories could be used for different service users. These guiding questions might help to reduce insecurities and intimidation and therefore establish a practice that is based on transdiciplinarity in Obrecht's sense (integrative applied science) and also in Kleve's sense (transdiscipline co-ordination science) by being a responsible part in the Mode 2 knowledge production process.

6 Conclusion

This chapter has highlighted roles of the different actors in the investigated knowledge production and utilisation process, namely practitioners, forensic psychologists and training providers. The knowledge derived from research findings in neuroscientific studies is reduced and summarised in overarching theories through key speakers. Training providers then transport this changed knowledge to practitioners. Finally, the knowledge is incorporated in existing theories and knowledge of the practitioners by developing a 'practitioner's neuroscience'. The practitioner's neuroscience is reduced to certain aspects of neuroscientific knowledge, which supports certain agendas, justifies specific practices, methods and tools and supports particular perspectives on aggressive juveniles.

On the other hand, in a world of increasing demands on practitioners in a changing culture of knowledge and evidence-based practice, juvenile justice practitioners portray themselves as passive up-takers rather than active knowledge seekers. This in turn leaves training providers in a form of 'sandwich position'. There seems to be little guidance from policymakers or other authorities on what kind of knowledge needs to be spread to practitioners. The training providers seem to be the driving force pushing certain knowledge, which is, for example, promoted by key actors like Perry.

By drawing on concepts from Obrecht, Kleve and Büchner (2012), the knowledge utilisation process was investigated in the context of transdisciplinarity of the social work profession. This knowledge utilisation process seems to lack a critical evaluation of knowledge on behalf of training providers and practitioners. It is therefore proposed to work towards empowering practitioners and training providers by increasing their knowledge on evidence-based practice and critical examinations of research knowledge. This also seems important as neuroscientific knowledge translated into practice has potential implications for ethics and values in the general approach to aggressive juveniles. Here, a focus on a more critical and responsible view of 'science' and 'theory' might help to refocus the trend to establish a view of aggressive juveniles as being 'brain-damaged' and concentrate on practical implications of used and discussed knowledge instead. This would also be in the sense of social work, or juvenile justice practice, as a transdisciplinary field.

10 Conclusion and Recommendations

1 Introduction

The purpose of this dissertation was to investigate how findings from neuroscientific research influence juvenile justice practice in Scotland. This chapter now returns to the aims and research questions, which have guided the research in order to summarise the core findings. Additionally, this chapter makes recommendations for practice as well as training provision. The chapter further reflects on the methodological strategies adopted for the present research and provides recommendations for future research in this area.

2 Aggressive behaviour in juvenile justice practice: a complex phenomenon

In order to investigate the influence of neuroscientific knowledge on juvenile justice practice for the purposes of this PhD, the area of knowledge was confined to aggressive behaviour. The reason here was to condense the wide field of neuroscientific research to a workable size. Additionally, it was necessary to find certain characteristics of numerous different and complex problems juvenile justice practice has to deal with every day that capture youth justice practice in the best

possible way. It was decided that a focus on aggressive behaviour should be sufficient for the incorporation of various aspects of juvenile justice practice, in addition to providing a range of different neuroscientific research findings for the investigation.

The guiding questions for Chapter 6 were:

- What is classified as 'evidence' of aggressive behaviour in a juvenile justice system as well as in neuroscientific research publications?
- What concepts of aggressive behaviour are in use in practice?

In the theoretical literature on aggression, a consensus on a definition of aggressive behaviour cannot be found (Gendrau and Archer 2005; Wahl 2009; Tolan 2007; Cairns 1996). As the concept of aggressive behaviour can be investigated and viewed from different perspectives, for example, from a sociological, psychological, criminological, philosophical and anthropological point of view, the term 'aggressive behaviour' can have different meanings. Additionally, the term aggressive behaviour is relevant for various diverse disciplines: education, psychiatry, psychology and criminal justice are just some examples of the wide range of professional fields aggressive behaviour might be relevant for.

For this thesis, the focus is on the field of juvenile justice practice, on neuroscientific research and a number of different training providers. These three different groups were characterised as social worlds (Gieryn 1995; Strauss 1987) as the members of the different groups share similar activities with each other: either working with aggressive juveniles, teaching about aggressive behaviour or researching aggressive behaviour on a neuroscientific level. The following paragraphs summarises the most important conclusions in respect of the different conceptualisations of

aggressive behaviour in the three investigated social worlds that were drawn from the collected data.

Juvenile justice practice

The social world of juvenile justice practitioners operates with all kinds of different criminal charges and behaviours. The practitioners interviewed for this study, however, clearly stated that many of their cases display some form of aggressive behaviour, even if this is not the primary focus of their attention or the reason for the criminal charge. For practitioners, evidence of aggressive behaviour is as difficult to define as it is challenging for them to draw clear boundaries around the concept of aggression: depending on the practitioners, the circumstances, the actors, the situation and finally the act of aggressive behaviour itself, what counts as aggression can be viewed very differently.

Of course, in juvenile justice practice, aggressive acts are often guided through the juvenile justice or criminal justice system in the form of criminal charges (Scottish Government 2002, 2009). The charges can be as different as, for example, 'breach of the peace', 'assault', 'robbery' or 'anti-social behaviour'. However, the way practitioners view aggressive behaviour goes beyond this.

For practitioners, the conceptualisation of aggressive behaviour depends on the purpose of their reflection: the perspective of report writing and assessment is different to a situation whereby a practitioner needs to de-escalate an acute situation in the office, home setting or secure unit. Here, on the one hand, theoretical knowledge, the use of tools and assessment skills, and on the other hand, social competence, experience and tacit knowledge are necessary for successful practice. Additionally, different aspects of aggressive behaviours need to be captured for the

task of planning or undertaking programmes and interventions with the young person.

Practitioners often use assessment tools as guidance, so that different observed behaviours in combination with theoretical definitions and practical experience make statements on the possible reasons for this behaviour, the risk of this behaviour re-occuring, and possible intervention strategies. Here, my respondents mainly named the Novaco Anger Scale, SAVRY, AIMS I and AIMS II. These tools are, for example, important for writing reports and planning the work that needs to be undertaken in order to promote change. The statements from the practitioners I interviewed showed that particularly the process of undertaking risk assessments is useful for a better understanding of the young person in their direct interaction. Practitioners identified the process of undertaking risk assessment as helpful for reflecting upon the behaviours and the potential reasons for them. This then allows more targeted approaches.

The common differentiation between anger, aggression, rage and violence did not capture this complex phenomenon for practitioners sufficiently. However, the interviewees mainly used the differentiation between behaviour and feelings in the context of conceptualisation of aggressive behaviour. This study has shown that, in practice, there is also a need for practitioners to take into consideration what the motivators for aggressive behaviour are, as this can help to determine the intervention approach: for example, is the behaviour in question instrumental or affective aggression (Berkowitz 1996)? This differentiation into behaviour and feelings seems to be prominent in the practitioner's understanding of aggressive behaviour. The perspective of the victim is part of the process of defining the motivation of aggressive behaviour. Additional to risk assessments, the 'Cycle of Assault' (Kaplan and Wheeler 1983) appears to be helpful for some practitioners to support their understanding of how a young person interacts and why they act the

way they do. The predominantly used theoretical concepts to understand aggressive behaviour in juveniles are theories based on emotional regulation and literacy, attachment theories and concepts based on trauma-related developmental theories. Aggressive behaviour is seen as maladaptive and challenging behaviour.

This study has shown that no agreed definition of the term 'aggressive behaviour' can be found for juvenile justice practice in Scotland. It can be concluded that aggressive behaviour is a very complex term for practitioners. The term 'aggression' is used in a range of different ways, invoking different formal and informal theoretical frameworks, for various different purposes and in different practical situations. Practitioners commonly slip between different sets of meaning. It is therefore rarely possible to say with any precision what juvenile justice practitioners mean when they use the term 'aggression', since the meaning of the term is so fluid and context-dependent.

One finding from this research is that most practitioners would welcome more specific training on aggressive behaviour to increase their understanding and their knowledge. Additionally, they also raised the need for an agreed, defined terminology for this field of work similar to the definition of violence for the juvenile justice system developed by 'The National Development (Champion) Group: Working with Children and Young People with Significant Violent Behaviour' in Scotland (CJSW Development Centre). This would allow more clarity and consistency in the way the terminology is used.

Training providers

Both social worlds of training providers (here especially forensic psychologists) as well as social work/juvenile justice practitioners used similar concepts and referred to the same risk assessment tools. This dissertation showed that, like juvenile justice practitioners, they draw on theoretical concepts based on psychological theories, a

differentiation of behaviour and feelings and emotional regulation and literacy, attachment theories and trauma related theories. In addition to that, training providers also referred to concepts of disorders of the DSM or ICD more often than practitioners.

In contrast to juvenile justice practitioners, however, their conceptualisation of aggressive behaviour is more based on theory than on practical experience as a consequence of their role. Although most of them have a practice background and sometimes continue to work with aggressive juveniles as well as being training providers, their arguments during the interview process were more focused on theory than on practical experience and skills. They generally made more links to theoretical literature and cited certain theories and concepts more than social work practitioners. An example here would be specific reference to Berkowitz (externalising and internalising behaviour and its definitions) and to specific disorders (for example, conduct disorder).

This would suggest that they seem to discuss theory with a more critical and reflective perspective than was observable by practitioners. A possible explanation here could be that training providers seem to be better at distinguishing between the different concepts and forms of aggressive behaviour. This is possibly due to the more distant perspective they hold when they are not involved with the clients directly as they are detached from the applied world. However, this could also be the case because they feel that they have a clearer perspective on aggressive behaviour, as they are more familiar with the literature. On the other hand, this does not mean that they have better answers on how to deploy the theory in practice. The research results did not allow the conclusion that the theories training providers refer to are unrealistic or not useful in the eyes of the practitioners. It is more likely that practitioners have not engaged with the theory as much as the training providers.

Neuroscientific publications

Most practitioners and training providers referred to neuroscientific research in the context of cortisol and brain development. Consequently, for the purposes of this thesis, and in order to keep the research within manageable boundaries, it was decided to focus the in-depth investigation of the social world of neuroscientific research publications on investigation of how those publications characterised the relationship between cortisol and aggression.

The identification and standardisation of aggressive behaviour in neuroscientific publications is based on the use of assessment tools like a current version of the DSM or ICD, as well as the Diagnostic Interview Schedule for Children (DISC), the Trier Social Stress Test and the Social Behaviour Questionnaire, to name just a few. The instruments and assessment tools in use are mainly based on psychological theories (for example, reactive, proactive and instrumental aggression and internalising and externalising of behaviour) or behaviour in the form of disorders (for example, conduct disorder or oppositional defiant disorder). However, although publications usually refer to the assessment tools used, they do not necessarily state exactly what their definition of aggressive behavior is. Instead, they mainly use empirical descriptions, not definitions or explanations. There seems to be a common set of ideas about the causes and explanations, even if they are not exactly defined or often summed up. This lack of differentiation sometimes seems to lead to mixed results and imprecise answers. However, as the aim of (neurosicentific) research is to try to generate such theories and explanations, the essence of aggressive behaviour is employed in the research.

Aggression as a boundary object

Drawing on the work of Griesemer (1989), aggressive behaviour can be seen as a boundary object that moves between the three social worlds just discussed. This means aggressive behaviour as a boundary object is something that is labile enough to be differently realised within different social worlds, but stable enough to provide a means or currency of communication and exchange between those worlds. This dissertation argued that juvenile justice practitioners build their knowledge about a young person's aggressive behaviour through their tacit knowledge, their observation and experience, and through using specific risk assessment tools. This knowledge base and set of practices is often different to other areas of practice with aggressive juveniles (for example, psychiatry and neuroscience).

The 'construction of aggressive behaviour' depends on the discipline and therefore the 'lens' used to define aggressive behaviour: juvenile justice practitioners construct aggressive behaviour through the lens of 'maladaptive and challenging behaviour'; the legal and judicial views of aggressive behaviour; their practical experience; and various psychological concepts. The framing of aggressive behaviour in this social world is therefore blurred and multiple. The exchange between practitioners and trainers – where actually many aspects of aggression, in particular, the underlying ideas of what aggression is and where it comes from remain the same – appears to be successful. However, the different perspectives on aggressive behaviour, or the different conceptualisations, affect the way the communication between the two social worlds is undertaken. There are already considerable differences visible in the way the two social worlds speak about aggressive behaviour: one social world defines aggressive behaviour more from the perspective of practical experience, whereas the other social world of training provision conceptualises aggressive behaviour based more by drawing on

theoretical concepts. In contrast to this, it can be summarised that in neuroscientific publications, aggressive behaviour is often viewed as a disorder or differentiated description of behaviour. This means that a practical and more psychological view of aggressive behaviour in a practice and training provision context contrasts with a more codified view of aggression that seeminly helps to seek rigorous scientific explanations in neuroscientific publications.

It can be concluded that although there are different concepts, there is no *overall* definition of aggression, evidence for this behaviour, or agreed terminology in the field of juvenile justice and social work practice and neuroscience research. This depends on the context and, therefore, on when and where the terminology is used.

The term 'aggressive behaviour' is regularly used without considering that this term might have different meanings in different social worlds and that this term is not a terminology with clear boundaries. It can therefore be concluded that there appears to be a considerable tension between the different social worlds in respect of the conceptualisation of aggressive behaviour and, consequently, in respect of the expectations of effective exchange of knowledge and understanding between them. This important finding does not appear to be necessarily evident to the actors of the different social worlds. These considerations are particularly relevant when the context of knowledge transfer, exchange, translation and utilisation is investigated: if the different social worlds have no shared concepts or agreed definition of the behaviour in question, or the behaviour is not clearly described when discussed, how can a purposeful and successful knowledge utilisation and exchange take place? The following paragraphs investigate this question further.

3 Neuroscientific research findings and juvenile justice practice - where and what are the links between the two seemingly unrelated subjects?

The focus of Chapter 7 is on the different (neuroscientific) theories and concepts, which are translated into juvenile justice practice. The guiding questions for these chapters were:

- What neuroscientific concepts, theories and results do juvenile justice practitioners use in their day-to-day work?
- How are these employed in practice?
- How is this 'practitioner's knowledge' similar or different to the neuroscientific findings from which it derives?
- How, and in what ways, does it differ?

This study has shown that practitioners and training providers draw on concepts from attachment theories, brain development and research on cortisol and, to a lesser extent, on concepts from stress response studies for their day-to-day work, if they refer to neuroscientific research findings.

Attachment theory, as originated by Bowlby (1969) and Ainsworth et al. (1978), has received more attention and interest over the past decade (Daniel and Wassell 2010). According to this theory, there are different forms of attachment styles, which influence the way we manage our social relationships: in a mainly secure, avoidant, anxious-ambivalent and insecure-disorganised form. The first few years of life and our relationship with our caregiver have a very strong influence on the way this develops (Daniel and Wassell 2010). This theory seems to be supported by neuroscientific research, as, for example, Moses and Knutsen (2007) argue: the

neuronal growth in babies depends on the relationship between the main caregiver and the child, and the ability of the caregiver to react to the child's cues appropriately (Schore 2001; Farmer 2009; Sroufe et al. 1999; Daniel and Wassell 2010; Connor 2004; Gerring 2004). Kagan (1998), on the other hand, criticises the emphasis on the first few years of life for the development of children and argues that the concept of different attachment forms is not well defined. He states that not every action or not-action of children will leave a permanent mark on a child's brain, but that the brain and the development of children is much more complicated and differentiated than these theories allow.

Loeber (2009) proposes a model which describes the relationship between the neurobiological factors and the social and contextual factors that influence the development of aggressive behaviour and violence: the interaction between social and individual and economic factors on the development of the brain is just one of the many different links that impact on the development of a child and show the complexity of this issue. For example, Connor (2004) suggests that the reading of social cues and consequently the processing of this information for some young people might be compromised due to childhood abuse experiences. Here, the role of the amygdala is important to mention, as the emotional condition appears to be located here (LeDoux 2000). This is in contrast to other forms of aggressive behaviour or violence, which might be a result of genetic effects (Moffitt 1993).

Additionally, different forms of stress in perinatal and prenatal development – for example, alcohol and drug abuse during pregnancy, neglect, physical and emotional stress during early childhood – might play a crucial role in the way the stress-system of the child develops (Teicher et al. 2012) or, on the other hand, how the self-soothing system (serotonin 5HT-System) is established (Cools et al. 2007). Mainly the development of the neocortex, the weakened integration of the two parts of the brain with a consequently heightened reaction in the limbic system, is mentioned as

a possible consequence of this. Additionally, the activation of the autonomic nervous system and hypothalamus-pituitary-adrenal (HPA) axis is of relevance here. The 'fight-or-flight' response – as a reaction to stressors in the life of young people and adults – is also linked with attachment and early years care giving (Gunnar and Donzella 2002; van Goozen and Matthys 1998; Hudson and Lowe 2004). However, there are also studies which do not establish this connection (McBurnett and Lahey 1991; Willig and Stainton Rogers 2008). Studies on cortisol levels play a significant role for these theories: cortisol, a hormone produced by the HPA-system, is thought to play a role between stress arousal and aggressive behaviour in young people. The stress regulation mechanism appears to work differently if cortisol levels are altered (Connor 2004). This also allows for the assumption that this might mean a possible lack of impulse control.

Neuroscience and juvenile justice practice: the importance of agents

One finding from this research is that Dr. Bruce Perry (Perry 1995, 2002, 2009; Perry and Hambrick 2008; Perry and Pollard 1997, 2008; Perry and Szalavitz 2006) has a key role for training providers as well as practitioners in the transfer and translation of neuroscientific concepts used in practice in Scotland. In particular, the discourse he and other prominent knowledge entrepreneurs use to present this knowledge plays a role in the way practitioners perceive and utilise this knowledge. This discourse establishes this knowledge as 'hard science' and 'facts.' Images and their use play a key role in this process. The majority of the practitioners referred to one specific image used by Perry[60], and therefore its role in the knowledge utilisation process seems highly important. By drawing on the work from Joyce (2005), a critical examination of the use of images in the process of knowledge utilisation was undertaken; and it seems that practitioners are guided by this image and its

message seemingly uncritically. According to Perry, there seems to be a correlation between extreme neglect or abuse and the size of the developed brain of the child at a certain point during the development. This, however, does not necessarily allow a generalised statement for the behaviour and the development of the individual service user. Factors like malleability and other developmental experiences might change this image if taken a few years later (Wastall and White 2012; Bruer 1999; 2001, 2012). This is not clearly transported to practitioners. Thus, the majority of the interviewed practitioners and training providers presume, after seeing these images, that neglect and abuse reduce the brain size of children and consequently promote maladaptive behaviour.

It became clear that these concepts are not only used in the context of aggressive behaviour but in (social work) practice with troubled juveniles and children in general. In addition, currently social work and juvenile justice practitioners have very similar general training and education. It is therefore concluded that these findings also apply to other areas of social work practice in children and family settings.

Neuroscientific research as an explanatory framework

This study found that practitioners use neuroscientific knowledge as an explanatory framework. This means that practitioners refer to these findings to validate existing knowledge (for example, attachment theories and trauma theories). This explanatory framework was used in discussion with other professionals, parents, and, for the workers, as a point of reference that supports certain beliefs and knowledge claims. Here, reference was made to the 'new' perspective this

[60] Please see image 8: Altered brain development following global neglect in early childhood. Society For Neuroscience: Proceedings from Annual Meeting, New Orleans (Perry 1997)

knowledge allows. The most common articulation was 'blame the brain' for aggressive behaviour, in contrast to getting annoyed or angry with the young person. It therefore leads to a more 'medicalised' perspective on the behaviour of the young person. This externalisation of a problem, by using the brain like a projection screen, stands in contrast to the widespread use of, for example, attachment theories. With attachment theories, the focus is on the relationship between the main caregiver and the new developing child. This lays emphasis on the behaviour, and therefore highlights the responsibility of caregivers. And, in a way, these theories blame caregivers for the problematic or unwanted behaviour. Here, practitioners can use neuroscientific research for different, sometimes conflicting, explanations as a point of reference. The use of neuroscientific research findings as explanatory frameworks can therefore be facilitated to work with other professionals or parents of juvenile delinquents on a more abstract and less judgemental way – the result is a perspective on aggressive behaviour in the context of 'blame the brain' rather than on the young person or his or her caregiver.

Additionally, these research findings can help to enhance understanding for service users and therefore provide a different perspective the behaviours they display. Here, it might support different approaches, as seen in for example secure units, which support change and positive developments.

However, it seems as if practitioners and training providers are not at all aware of the disparity of some of the used explanations. The 'medicalised' approach of explaining aggressive behaviour does not come without its difficulties either, which is summarised later on in this chapter.

4 Inter-/transdisciplinarity and emotions – the tricky process of knowledge utilisation

Chapters 8 and 9 of this study focus on the knowledge utilisation process, its key actors and how emotions influence this process within the tension of inter- and trans-disciplinarity of juvenile justice practice. The guiding questions here were:

- How does the process of translation between neuroscience and juvenile justice take place?
- What is the role of professional mediators, such as social work trainers?
- What is neuroscience in the view of practitioners?

During this study it became clear that although there is a vast amount of neuroscience research, which could be relevant for practice, at the moment, there is possibly not enough neuroscientific knowledge, which is transferred or translated into practice, so that the term 'knowledge translation' does not fit very well. Here, this process is therefore referred to as 'knowledge utilisation process' instead. The key actors of this process are practitioners, forensic psychologists and training providers, as well as key speakers. Key speakers and knowledge entrepreneurs utilise theories derived from neuroscientific research findings as well as images supporting the transport of certain messages and belief systems.

Knowledge utilisation and social work practice

The concept of knowledge needs further explanation at this point: for this project, the focus is placed on practitioner's knowledge. Pawson and Boaz (2003) argue that practitioner's knowledge is influenced through practice, media, education and training, discussion with other professionals, and through attendance at meetings.

The relationship between the various categories of knowledge is important to investigate, too: theoretical, factual and practical knowledge are all interrelated and supplement each other (Trevithick 2008). Theoretical and factual knowledge, here specifically neuroscientific knowledge, was the main focus of attention of the research project. For juvenile justice and social work practice, factual knowledge might help to assess people's situations and behaviours and therefore shapes individual practice (Trevithick 2008). However, the influence of practical knowledge on the way theoretical and factual knowledge are integrated into the knowledge base of the practitioner is also part of the investigation process.

The integration of this research evidence into the day-to-day work of practitioners is a complex issue: here, particularly the 'Coordinated Implementation Model' (Lomas 1993) needs to be mentioned. The relationship between the different forms of knowledge and the different influences of various environments is set in context. According to this model, the practitioner's knowledge develops through the process of knowledge implementation and personal influence, as well as the external influence of factors such as the economy, community and administrative factors. The individual client in turn, influences this. The differentiation of knowledge-for-practice and knowledge-in-practice (D'Cruz 2009) reduced the complex model of Lomas to a perspective that fits well for this thesis: neuroscientific knowledge needs to be implemented in a way that enables practitioners to deal with the individual needs of the service user in the best possible way. Farmer (2009) has investigated the specific relationship between social work practice and neuroscience. Her transactional model focuses on the individual solution for practitioners and their service users with a holistic approach. Farmer's emphasis is on the importance of avoiding a reductionist perspective, and in turn, an over- or underenthusiasm for neuroscience (Farmer 2009). It can be summarised that the process of knowledge utilisation is very complex. It was therefore necessary to focus on one specific area of knowledge to undertake this research.

For social work practice, the influence of the different forms of knowledge on professional practice cannot just be reduced to theoretical knowledge and facts, as personal and practice experiences also influence the way the work is undertaken. The 'what works?' agenda and the trend to work towards standards of 'evidence-based practice' (Davies and Nutley 2000) have guided juvenile justice and social work practice in the UK over the past decade. The trend of professionalisation of practice can only be successful, if, as Straus et al. (2005) summarise, the combination of research evidence, the practical experience and the individual circumstance of the service-user are put together. Here, the concept of practice or professional wisdom is important to mention, as this goes beyond the application of research evidence and research knowledge and includes the personality and experience of the individual practitioner as well as organisational processes (Clark 2011, Dunne 2011). On the other hand, 'evidence-based-practice' is not only important for the best possible standard of practice, but also for the accountability and transparency of (public) services (Gibbs and Gambrill 1999; Gambrill 2006). This is also an expectation the Scottish Government and policymakers highlight in the Social Work Review (2006).

The ESRC as well as the Scottish Government have emphasised the importance of the investigation and the promotion of the relationship between knowledge and goodover the past few years. An example of this is The Institute for Research and Innovation in Social Services (IRISS), which supports practitioners as well as policymakers in the implementation of research evidence. 'A Strategy and Action Plan for Embedding Knowledge in Practice in Scotland's Social Services 2012-2015' states that The Scottish Government, NHS Education for Scotland, the Institute for Research and Innovation in Social Services, the Improvement Service for Local Government, the Scottish Social Services Council and the Association of Directors of Social Work strive towards 'making best use of the published knowledge and evidence base, combined with sharing, reflecting and learning from experience, and

using knowledge gained' (Scottish Government 2012: 5) in order to improve practice.

It can be concluded that there is an increased interest in improving services by strategically and structurally improving the link between research and practice between the different agents and institutions.

Although there is a trend to increase policy documents, guidelines and research on this topic, the focus of a specific area of knowledge and its influence on social work practice has not received much attention so far. The following paragraphs review the most important findings of this study on the complex knowledge utilisation process.

Askeland and Payne (2001) argue that the focus of social workers' knowledge is more based on an extensive range, rather than an exhaustive detailed field of knowledge, that seems to be sufficient for a successful practice. By establishing aggressive behaviour as a boundary object, this study has shown that key speakers and actors condense and smooth over the complexities of neuroscientific research findings. Training providers and forensic psychologists continue this process by further reducing and summarising this knowledge. These summaries are in the form of overarching theories, which reduce the scientific contents to more general statements and less scientific details. Additionally, these extractions are often utilised and integrated in other familiar theories and knowledge of practitioners. Consequently, this knowledge base is less detailed than scientific publications and more based on broader concepts, but draws on certain aspects of specialised knowledge from other disciplines. This was called the 'practitioner's knowledge.'

Here, it became apparent that the utilised and integrated knowledge concentrates on certain aspects of neuroscientific knowledge, whereby practitioners and training

providers do not mention or utilise other, possibly also relevant, research: examples here are empathy, mirror neurons, or working with trigger points, which might also help to enhance understanding for the individual client. As the knowledge utilisation of neuroscientific knowledge seems to just have started in this field, this might happen in the future. Generally speaking, it seems that utilised knowledge supports existing practice and policies, methods and perspectives on youth violence and aggression. The question here is: 'Was this knowledge chosen because it does support these practices or does this knowledge support these practices?' It was unclear, why certain research findings are transported and other areas of research are not familiar to practitioners. However, it became clear during this research process that the utilised knowledge supports certain existing beliefs, perspectives and knowledge claims.

In a world of increasing demands on practitioners, and in a changing culture of knowledge and evidence-based practice with less funding and resources, juvenile justice practitioners have portrayed themselves during this study as passive up-takers rather than active knowledge seekers. As a consequence, this leaves training providers in a form of 'sandwich position' between research publications, knowledge entrepreneurs and practitioners. There seems to be little guidance from policymakers or other authorities about which knowledge needs to be spread to practitioners. The training providers appear to be the driving force that pushes certain knowledge, which is promoted, for example, by key actors like Dr. Bruce Perry. It could therefore be argued, that they are not only key actors in the knowledge utilisation process, but also carry a lot of responsibilities as they are in charge of the kind of knowledge and the way knowledge is transferred to practitioners.

However, following these conclusions, it can be said that the role of co-workers and line managers emerges to be important in the process of conceptualisation of

aggressive behaviour: discussions about thresholds and how certain acts or aggression are viewed regularly inform the practice of assessment and planning and can have an impact on the behaviour of the individual practitioner. This is particularly important when financial restraints on local authorities result in the reduction of office space and increases the lone working time of practitioners – as communication with other staff members might be reduced as a consequence of this, too.

Emotions and knowledge utilisation

These aspects are particularly relevant, as it became apparent that the following emotions – hope, disappointment, intimidation as well as fascination – highly influence this process. This could be established in the way practitioners and training providers view and perceive neuroscience. Pickersgill (2011) found in his study that the influence of neuroscience on the treatment of personality disorder results in mixed views by clinicians, whereby feelings of hope, doubt and resistance seem to be prevalent. In this study, resistance towards accepting this knowledge could not be found; however, it is unclear if this might be a result of the recruitment process. It is possible that practitioners and training providers with feelings of resistance against this knowledge did not take part in this study. Only one practitioner stated that she does not 'believe' in attachment theory.

It is interesting to note, however, that in Pickersgill's study, the feeling of intimidation did not play a role. For this study, this might imply that practitioners seem to have very little understanding of the possibilities and limits of neuroscientific research and therefore expect some kind of new, advanced and 'super power' method and tool from neuroscience that should help them improve their practice. Slaby (2012) calls this a development of a 'dream factory', whereby a

crucial lack of criticism towards the discipline of neuroscience results in an 'over- or underenthusiasm' (Farmer 2009).

Considering the findings from Chapter 6, this point is highlighted: neuroscientific research publications are very cautious in talking about 'aggression' as a clear-cut phenomenon, while practitioners presume that science can give them precisely such clarity. Some practitioners referred to the limits of their day-to-day practice in working with aggressive juveniles and how insecure they felt as a consequence of this. As a result, their hope is that neuroscience might give them the answers they are looking for and provide them with tools, techniques or new insights into the brain so that they can adapt their practice and provide a better service. On the other hand, when the focus is placed on the malleability of the brain, this can provide hope and support practice, as change is possible.

Intimidation, here this means anxiety, fear of getting it wrong and the feeling of maybe not being clever enough to understand this complex scientific researchmight therefore lead to a less critical perspective, and consequently disappointment if hopes and expectations are not fulfilled. The interviews with practitioners seem to confirm this. Additionally, disappointment can also be found as the generalisation and externalisation of 'facts' might lead to the belief that the brains of the young people are 'damaged' and nothing can be done about this anymore. This point particularly refers to the difference of 'knowledge-for-practice' and 'knowledge-in-practice' (D'Cruz 2009). Practitioners need to make factual knowledge useful and meaningful for them and implement this in their work. During this process, emotions seem to play a significant role for the success of this transition: it seems that the presented knowledge might not be integrated successfully if emotions like disappointment and intimidation are influencing this process. Factual knowledge might then be discarded or misinterpreted.

5 The risk of constructing aggressive juveniles as 'traumatised and brain-damaged/impacted juvenile'

Chapter 8 concentrates on the influence of emotions on the knowledge utilisation process as well as focusing on the influence these have on the way aggressive juveniles are viewed by practitioners.

Here, the focus on trauma-related theories as well as attachment theories has received increased interest. This is due to the fact that most practitioners and training providers referred to these concepts. Within a welfare approach, the focus is on the development and upbringing of the young person in trouble, and less on the offence itself (McAra 2006). This therefore means that there is an emphasis on explanatory frameworks, which capture the problems the young people have. In the context of this dissertation, it became clear that the current understanding of practitioners of offending behaviour focuses mainly on attachment and trauma-related theories as explanatory frameworks. These theories therefore concentrate on the effect of negative life experiences like loss, abuse, lack of care and so forth, and the development of the child or young person (Bandura 1977; Weisaeth 2002; Kolk and Roth 2005; Salmond and Meiser-Stedman 2011). As a consequence of the attention neuroscientific research and some prominent speakers (here, for example, Dr. Bruce Perry) have received, the concentration on the brain damage that results from these negative life experiences has seemingly increased. The construction of aggressive juveniles by practitioners as being somehow brain-'damaged' or 'brain-impacted' seems a logical consequence of this development. The result is a perspective on aggressive juveniles as having a deficit or lasting damage in their brains. This research has shown that practitioners as well as training providers have, at least in part, adopted this perspective in their work.

The described theories on aggression are used to better understand what young people have experienced and why they behave the way they do, with the purpose of developing a strategy that might help them to have more successful, safer and happier lives. The problem is that this perspective leaves these young people even more in the role of a victim of their upbringing than other theories do, and concentrates on the deficits rather than strengths and abilities. Additionally, as we are now not only talking about a learned behaviour, but damage in their brains, this perspective is not only disheartening for the practitioners but also results in a feeling of hopelessness and questions of 'so what can we do when there is this damage'? The neuroscientific research does not give any clear answer to this question.

The additional issue here is also, that as a consequence of this shift in perspective and the focus on the construction of the 'brain-damaged juveniles', practitioners seem to forget or push away other reasons for aggressive behaviour. Examples here are peer pressure and boundary testing (McAra and McVie 2010). Additionally, these concepts are adopted and used without formally assessing these young people for trauma or attachment difficulties. Here, the young person's life history is enough to make these statements.

Knowledge entrepreneurs, training providers and practitioners, therefore, use this knowledge to provoke a shift in thinking and attitude towards the young people with the goal of achieving more empathy and understanding. The main goal here is to provide a better service. The downside of this intention is the negative effect this might have: if all aggressive juveniles are seen as traumatised and having attachment problems, this constructs aggressive juveniles as 'brain-damaged' in this context. The development here, therefore, is a medicalised perspective, which blends out the influence of the wider society and economic circumstances, but concentrates on the individual and his or her brain. It further transports the message

that there is only one explanation or truth about these juveniles ('hard facts'). Bruer (1999, 2010, 2012) and Wastall and White (2012) revealed similar observations in the policy context. This knowledge is also used at a policy level to emphasise the importance of early intervention to prevent mental illness, substance misuse and criminal behaviour. Here, the same mechanisms apply as just described. The instrumentalisation of this knowledge to increase understanding, empathy and better services might come at a high price if aggressive juveniles are perceived as 'brain-damaged' or 'brain-impacted'.

This stands in contrast to the possible other attitude and perspective, which could be drawn from this research, too: as the brain is able to change, a change in behaviour is possible and therefore supports the work of juvenile justice practice. However, during this research interviewees focused on the damage rather than the mealleability of the brain.

Slaby (2010), Cohn (2010) and Pickersgill (2012), to name just a few, examined this readiness of acceptance of knowledge under the heading of 'hard facts'. They underline the importance of implementing a 'critical practice' in order to be aware of the mechanisms that are involved with this enthusiastic approach to this kind of knowledge. Here, the fascination with this approach needs to be mentioned, which might result in a lack of criticism. Particularly by looking at social work practice, whereby the traditional approach is based on a holistic perspective, this development to a medicalised perspective seems problematic.

It is therefore vital to have a critical perspective on this knowledge and to consider these consequences carefully.

6 Social work practice as a transdisciplinary practice

Within the history of social work, the discussion about the influence of scientific knowledge from other fields has received significant attention (Staub-Bernasconi 2002). The question of how this knowledge is made useful for practice is of great importance in this context. Büchner (2012) argues that transdisciplinarity is the integration of knowledge from different disciplines, which goes beyond interdisciplinarity. It combines knowledge from various sources and utilises it for practical application. Therefore, the boundaries of the different disciplines are overcome more easily than with interdisciplinarity (Büchner 2012). Kleve argues that transdisciplinarity employs various theories and makes them useful for practice (Büchner 2012). Obrecht, on the other hand, is far more cautious as, in his opinion; transdisciplinarity for social work is not yet achieved. In his understanding, transdisciplinarity is based on a 5-level knowledge integration system, whereby the meta-level of knowledge integration plays an important role. As social work practice currently only integrates scientific findings for practice, it can therefore not be classified as transdisciplinary practice (Büchner 2012). Miller (2011) on the other hand states that transdisciplinarity is essential for the description of social work. These considerations are important for the understanding of social work as a profession, and how social work practice and research integrate, use and apply this knowledge.

As argued in the previous paragraphs, the utilisation of neuroscientific knowledge for juvenile justice practice comes with certain side-effects: the influence of emotions, as well as the influence of expectations on the precision and the state of knowledge of scientific research, impacts on the way knowledge is viewed and perceived. Additionally, the knowledge itself changes attitudes *towards* service users and arguments and discussions *with* service users, parents and other professionals.

All these elements have an influence on the way juvenile justice practitioners conceptualise aggression as a boundary object.

The process of knowledge utilisation in the investigated context sometimes seems to lack a critical evaluation of knowledge on the part of some training providers and practitioners. As a consequence, it is therefore proposed to increase their knowledge on evidence-based practice and concepts for critically examining research knowledge to empower practitioners and training providers. The more theories and concepts from other disciplines influence social work practice, and the more expectations there are to work with an evidence-based practice approach, the more practitioners need to be able to critically examine (factual) knowledge. At the same time, it is important to consider practice wisdom as well as the limitations the application of research evidence has in an applied field: the link between '…on the one hand, theoretical, basic science (episteme) and, on the other, practical, applied science (techne). The absence of this link between basic and applied social sciences does not mean that these science do not continue to play a role as techne… that is, a techne governed by value-rational deliberation' (Flyvbjerg 2001: 167).

So far, practitioners and training providers do not seem to be very involved in Mode 2 knowledge production. Mode 2 knowledge production can be distinguished from Mode 1 knowledge production as follows: Mode 1 is classical academic knowledge production, whereas Mode 2 knowledge production is created by the practical application of knowledge (Gibbons 1994, 2001; Hessel and van Lente 2008). This, however, might be necessary so that juvenile justice (and social work) practice can be accepted and recognised as a professional workforce with an explicit knowledge base. As shown with this research, specific knowledge from other disciplines is not easily translated and implemented into day-to-day practice. This process requires a workforce that is able to responsibly and effectively utilise this knowledge and combine this with professional wisdom. Here, the emphasis on the concept of *theory*

might be a useful approach. The following guiding questions have been developed during this research process that might help to guide practitioners and training providers with the implementation and utilisation of knowledge:

- What does this *theory* or research finding really mean for our practice?
- What does this *theory* mean for this specific service user (for example, is he or she really traumatised)?
- What does this mean for our relationship with our service users and their parents?
- What does this theory mean for the way we work with our clients?
- What kind of perspective does this *theory* provide on our clients and service users?
- How does this knowledge fit with our attitude towards service users and the spirit of social work

This approach might help to increase participation in Mode 2 knowledge production and the fulfillment of the requirements of a transdisciplinary profession in Obrecht's (integrative applied science) as well as in Kleve's sense (transdiscipline co-ordination science).

Additionally, if the aim were for practitioners to become active knowledge seekers, this would also incorporate being able to use knowledge, for example, from neuroscientific publications to develop interventions for their practice. I argue that for the enhancement of a professional identity, this responsibility should not be handed over to other professions (for example, to psychiatry or psychology) who do not work in the field of social work or juvenile justice practice. It is vital, if social work as a profession wants to increase its status that this part of the responsibility belongs to the field itself. Social workers, training providers, as well as social work universities, are familiar with the social worlds of their field and their service users.

They have knowledge about their day-to-day job and what they need in order to be effective with their clients. They should be able to draw on transdisciplinary knowledge and develop interventions that work for their practice themselves. The other suggestion would be to install programme developers, learning development officers, or similar, to undertake the work of developing intervention strategies as this is already practised in some voluntary organisations and councils. However, the important aspect here is that, as a consequence, practitioners and training providers need to develop strategies so that they can *own* the knowledge they use.

It is therefore claimed that it is time to invest in a more critically oriented theoretical approach in social work that enables practitioners exactly this: a critical examination of the research knowledge provided. It is important for the profession to work with the concept of evidence-based/informed practice and to be more robust in the way evidence is used, however, here it should not be forgotten, that social work practice needs practice wisdom (Clark 2011) and strong practical skills (McNeill et al. 2005).

It was established during this study that the hierarchy of evidence can be divided into research evidence versus legal facts in social work practice. This is different to and more complicated than, for example, the way NHS guidelines of evidence-based practice are presented. It might therefore be necessary to develop different guidelines for social work practice to incorporate all evidence necessary for practitioners in their day-to-day work. Otherwise, the profession might run the risk of shifting the mind-set of the social work approach to offending behaviour, which might lead to a concentration on the individual and thereby risk stigmatising children and young people with aggressive behaviour. This is in contrast to the traditional social work approach embraced by the profession in Scotland (McAra 2006).

At this point, what practitioners need in order to incorporate these additional expectations into their practice has to be discussed. What is left for practice when knowledge is investigated critically and more emphasis is placed on 'theory'? A side effect might be that practitioners are hindered and stopped from fulfilling their duties efficiently as questions arise: what is actually true and what is evidence for good practice? If research results do not leave clear externalised results or if results contradict each other, practitioners might feel left alone with their insecurities in their practice.

This leaves no clear-cut answers; however, knowledge for practice should be understood as helpful to understanding the individual better and, therefore, to achieve a greater ability to practise and work with an individual service user. This is discussed by Kaercher et al. (2012), as they promote a 'comprehension approach and diagnostics', which implies that different elements and key information are relevant for the discussion of individual cases: diagnostics and assessments from social work, from medicine, from psychology and neuroscience, and the analysis of countertransference, are necessary to comprehend the individual and his or her problems and dysfunctions. The different elements and key information serve as a medium, which help to understand and develop theories of dysfunctions and maladaptations. However, none of these elements or information can provide more than a hypothesis; none of them provide 'facts' that can be used as such (Kaercher et al. 2012). Here, a reflective environment with case discussions and peer reviews might help to overcome these obstacles. This requires additional time and resources for the individual practitioner and needs to be supported by management as well as politics.

The critical examination and utilisation of knowledge seems an important recommendation of these research findings, as neuroscientific knowledge translated into practice has potential implications for the ethics and values of the general

approach to aggressive juveniles and consequently on the spirit, juvenile justice practice is undertaken. However, the individual training provider or practitioner is not necessarily able to see this by focusing on singular research publications or individual key actors. This aspect also needs to be incorporated into curricula at universities, which teach social work. Kleve's (2006, cited in Büchner 2012) suggestion with regard to the analysis of theory might be of use for this dilemma: the differentiation of the analysis of knowledge, namely content, system level, and social and policy level might lead to a better understanding of the implications of knowledge utilisation from different disciplines into practice.

This approach could also be used by in-house training sessions or peer group discussions. Here, a suggestion is made to reconsider transdisciplinarity in Obrecht and Kleve's sense: 'In what direction does the profession want to develop'? Of course, this thesis is not able to end this discussion; however, in my opinion, a shift in the following direction should be anticipated. Based on the findings from this research study, I argue, that in contrast to Mittelstrass (2003, cited in Büchner 2012), transdisciplinarity is not only important for research, but, it is also important for practice and practitioners. With a transdisciplinary approach, namely, with the aim to own knowledge rather than to be users of knowledge, this allows practitioners to integrate different theories and concepts into their work and develop their own tools and methods to provide the best service possible. However, this concept includes practice wisdom as a vital part of knowledge application in practice: theoretical knowledge is only one part of the practical application, it needs to be underpinned by trusting relationships to service users, by fulfilling the diverse roles of social workers in the context of being mediatiors and voices for services users in various context as well as by trying to support them to reduce their difficulties. However, here theoretical knowledge can be supportive as it might help to better understand the problems and adversities service users are faced with.

This understanding of transdisciplinarity is closer to Obrecht than to Mittelstrass (2002, cited in Büchner 2012), however, I disagree with his statement that knowledge should be provided by the international community of social work. Therefore, my understanding of transdisciplinarity is probably closest to Kleve's concept, which involves the integration and also the co-ordination of knowledge (Kleve 2006; Büchner 2012).

7 Working towards more specialist and trained practitioners

It has become clear during the research process that practitioners feel a gap of knowledge in respect of aggression, violence and also in respect of neuroscientific theories. It has been established that there is also a gap in critical examination of theories used in practice. In a world of increased expectations from juvenile justice practice and a need of a strong evidence base for practitioners, it is recommended that further specialist knowledge for practitioners should be offered. A suggestion is made, to include relevant research findings, approaches and theories based on the findings discussed above. Additionally, the importance of a critical perspective on the theoretical findings within a transdisciplinary field needs to be acknowledged and integrated into training programmes.

8 Reflections on methodology

This study has used a mainly qualitative approach to explore the topic. This has included contact with 29 practitioners and training providers in different juvenile justice settings in Scotland. Also, one neuroscientific researcher with a special interest in attachment theory was interviewed. The settings here included council services, a voluntary organisation, and secure accommodation units as well as in-house and independent training providers. The interviewed staff had a wide range of jobs, including social workers, secure unit care workers, forensic psychologists, a CAMHS nurse, one team and one service manager. In order to achieve more depth and quality of the collected data, expert interviews were mixed with focus groups in the form of a case study approach. This allowed an in-depth exploration of different opinions and thoughts of the interviewees and therefore supported the explorative approach of this study. These results were combined with a discourse analysis of the most important neuroscientific research findings relevant for this study, as well as the most influential promoter of this knowledge, Dr. Bruce Perry.

However, this approach has not been without its limitations. It has turned out that the neuroscientific knowledge for practice currently only has a limited influence for the work of practitioners. Consequently, the only way to capture these often very tacit influences was through qualitative methods. As this study was intended as an explorative study, this was to be expected. The results allow statements more on a theoretical and philosophical than on a practical level. The conclusions drawn in the end do not provide clear strategies for practitioners but promote a shift in thinking. The practical strategies proposed are intended for university staff and training providers, and therefore might have an influence on practitioners in the future.

A mixed method approach with an additional component of a quantitative approach in the form of a survey was considered. This approach would have allowed statements on the level of knowledge (as in an exam) of neuroscientific research, the concrete sources of the used research findings, and how relevant the practitioners viewed this for their practice. However, it was decided against this, as a survey in this context would have shifted the focus of the study to aspects, which have already been discussed during the interviews, and the additional quantitative results would have not added enough value to justify the additional workload. This was also relevant in the consideration of the return quote of a survey. Practitioners and training providers already were intimidated by the word 'neuroscience' and often said that they could not display any neuroscientific knowledge. Here, it was therefore expected that the return rate of a survey, which would have increased this intimidation, would have been very low and the validation of the results would possibly not be sufficient.

It was additionally considered including a comparative element with another country; for example, Germany or England, as these countries have a different approach to juvenile justice practice. Here, it would have been interesting to investigate how the approach of the system influences the way knowledge is included, implemented and conceptualised. It could be hypothesised that a country like England, where a punitive approach to youth crime is prevalent, would encourage practitioners to a lesser extent to include neuroscientific research findings on their assessments and understanding, as the focus is on the act of crime and its consequences rather than the (family) background of the young person and the circumstances that led the young person to a criminal act or behave in an aggressive manner. However, due to the fact that I was a lone researcher with time resource restraints, it was decided that this aspect of research would not be included in this study.

It could be argued, that a further limitation of this study is the recruitment of professionals. It has been discussed at several points that the word 'neuroscience' intimidated professionals and that some of them consequently did not want to take part in the interview process. Here, my insider knowledge as well as my personal connections helped to overcome this obstacle on some occasions: because the interviewees knew me, they agreed to be interviewed although they were intimidated. This was a positive effect of being an insider, which would not have happened otherwise. I would have probably never learned about this fact without my personal connections or I would not have had the chance to interview intimidated practitioners. Therefore, due to my specific circumstances, the recruitment of the practitioners was probably less biased than it would have otherwise been and this adds to the validity of the results.

My personal academic and professional history has provided the ground for this research project: studies in biology and psychology at the University of St. Andrews (Scotland), a German degree in Social Work, Diplom in Sozialer Arbeit (FH), and a Master of Science (by Research) in Social Policy in combination with many years of working experience as a qualified social worker in children and families services in different local authorities across Scotland inspired the leading research questions for this PhD. My attitude towards neuroscientific research findings and its uses for the social work professions has been shaped and changed by the investigation of the research questions. Here, particularly theories and approaches from the Sociology of Scientific Knowledge in combination with my own practical experience in a biological laboratory during my studies at the University of St. Andrew's have provided me with various different critical ideas to investigate the research questions in depth and thoroughly. This personal development has therefore also shaped the argument of this PhD and supported the suggestion of the proposed recommendations and conclusions.

My personal development process during this PhD has started with an interest in neuroscientific research and what the research findings might add to practice in children and families services. For example, through the study of papers in the area of Critical Neuroscience on the emergence of neuroscientific research findings and how stable and conclusive these findings are seen by the scientific community, my view on 'scientific facts' has changed. This, in turn, allowed for an analysis embracing the idea of transdisciplinarity.

At the end of this PhD, however, as a researcher, I am alarmed by the way, neuroscientific research is transferred and utilised and I am concerned that this knowledge transfer might lead to a very different, more medicalised focus on service users than presently anticipated by practitioners and training providers. There is great potential for a shift in attitudes and practice resulting from this observed uncritical and not thought through use, reference to and instrumentalisation of knowledge that is obscured and changed from the original research findings. My concern lies here with the fact that professionals, as well as training providers, are not aware that this knowledge might be altered and simplified or even not as factual as one might want to think. This development might even lead to very crude ideas of the use of youth justice services in the light of the hype, early interventions and the early year debates perceive with the used 'neuroscientific evidence'. It can be argued, that neuroscientific research findings might help to change attitutes and practice towards a stronger belief in change due to the malleability of the brain and a better understanding of the difficulties the service users endure. Unfortunately, the majority of the practitioners did not represent this and training providers I have spoken with, as their focus was on the deficits rather the resources of the service users.

This study also highlights the problems of the divide between theory and practice, as for me, the results show a profession, which expresses a lack of self-confidence

towards the (natural) scientists and also a profession, which has to improve its ability to critically observe and investigate research findings. This is particularly relevant, if we want to provide a practice and a 'social science that matters' (Flyvbjerg 2001).

The observed approach to knowledge might negatively influence the way, the profession is perceived by other professional groups who are more critical attuned or use a different, perhaps more careful, language when they refer to scientific knowledge. This then in turn might have an effect on the way, practitioners in social work get treated and how serious others take their recommendations and actions. In the long run, this might eventually result in a loss of credibility. Therefore, in my eyes, this observed attitude and mindset towards knowledge might have a very negative effect on the profession itself and, similarly, on the perception of the profession in the wider society.

It also has to be said, however, that the increased expectations towards more professionalisation and a more critical workforce does not sit well with the constant financial restraints that are put on local authorities and consequently the increased workloads practitioners have to handle. Critical thinking and awareness of theory and cutting-edge research requires time and effort, both are difficult to find if work pressures continue to rise.

9 Directions for future research

This dissertation has found a link between the attitude and perspective on specific knowledge, here neuroscienctific research findings, and the way knowledge is utilised and employed in practice. There is a need to investigate this relationship

further, and it would therefore be useful to include universities and students and their perspectives on theory-practice and neuroscientific research and its influence on practice. This might help to promote the future of the profession and supports the development on attitudes towards other disciplines. Also, there is a need to include universities and students in the development of theories and knowledge for practice as well as the link between theory-practice-research in the sense of transdisciplinarity (Mittelstrass 2003; Büchner 2012; Obrecht in Büchner 2012; Kleve 2006).

This study has focused on the juvenile justice practice aspect. However, as there is a trend in Scotland's social work field to work on these issues with an interdisciplinary approach (GIRFEC), it might be useful to include, for example, education, the police and the 'Violence Reduction Unit' in Glasgow for a future project on aggressive behaviour and juvenile justice practice. Here, the view of other professions might add valuable insight into the research questions.

This dissertation has focused on the aspects of a welfare approach in juvenile justice practice and how this might influence the utilisation of certain neuroscientific research findings. It would be important to investigate if the same kind of utilisation of this knowledge applies in other countries where a juvenile justice system is more based on punitive approaches. Here, a comparative element would give valuable insights into the way knowledge is utilised and implemented in practice and how this shapes the perspective on juvenile offenders. This could also increase the understanding of transdisciplinarity and the approach of knowledge from other disciplines and how this can be improved in the context of neuroscientific research.

10 Conclusion

The influence of other disciplines on core social work theories is a crucial part of a discipline that draws heavily on knowledge from other professions. Therefore, knowledge utilisation is part of the self-understanding of the work of practitioners and social work researchers alike.

Aggressive juveniles in contact with the different social work departments in Scotland confront practitioners with complex problems and challenge practitioners every day. Due to the complexity and the diverse reasons for aggressive behaviour, there is not one single intervention that works for all aggressive juveniles. Here, a multitute of knowledge and skills are required to support the young person in his or her journey to overcome the various different problems and reasons for this behaviour.

Practitioners and training providers are interested in neuroscientific knowledge to support their practice. The use of knowledge from other disciplines such as, for example, neuroscience can help to develop a knowledge base and tailored intervention strategies if this knowledge is implemented and used by practitioners. Neuroscience can enhance our understanding of the underlying problems the young person faces. However, it cannot give us a 'quick fix' or a 'miracle cure' that would make a tailored assessment and a working relationship with the young person obsolete. Neuroscientific knowledge can serve as a source of information within the pool of other data, material and knowledge from other disciplines and, last but not least, needs to be combined with practice wisdom.

This PhD has shown how difficult it is for practitioners to keep up-to-date with highly complex knowledge from other unfamiliar disciplines from a *critical*

perspective, if there is not a change of culture where this is valued and supported by politics, management and training provision. The danger, if this requirement is not noticed and embedded in practice, is a development towards a medicalised or biologised perspective on aggressive juveniles. Nevertheless, a successful culture of critical knowledge utilisation provides the basis for a strengthened and professional practice, which supports the delivery of good services for young people, their families and society alike.

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Appendix 1:

Research Questions:

- What neuroscientific concepts, theories and results do juvenile justice practitioners use in their day-to-day work? How are these employed in practice?
- How is this practitioner's knowledge similar or different to the neuroscientific findings from which it derives? How and in what ways does it differ?
- How does the process of translation between neuroscience and juvenile justice take place? What is the role of professional mediators, such as Social Work Trainers?
- How is the use of neuroscientific concepts in practice shaped by the practice context?
- What is 'neuroscience' in view of juvenile justice practitioners?

Interview Schedule

1a) Practitioners:

- What do you classify as ‚evidence' of aggressive behaviour?
- What concepts and theories of aggressive behaviour do you use?
- What methods, tools and programmes do you use with aggressive juveniles?
- How and where do you get knowledge for your practice?
- Do you see that concepts and tools you use are based on science?
-

1b) Trainer and Consultants

- What do you classify as ‚evidence' of aggressive behaviour?

- What concepts of aggressive behaviour do you use?
- How and where do you get knowledge about aggression and violence?
- Do you see that concepts and tools you use are based on science?
- Who is simplifying the knowledge for trainings, how is this undertaken?
- On what grounds are decision made if the knowledge is useful, valid or true?
- In your opinion, how much influence does the political climate have on knowledge that is transferred to practice?
- In your opinion, how much influence does the philosophical reasoning have on knowledge that is translated to practice

1c) Service / Senior Management

- What is classified as ‚evidence' of aggressive behaviour?
- What concepts of aggressive behaviour are in use?
- What is influencing the implementation and development of methods and tools for working with aggressive juveniles?
- What is classified as evidence in the process of formulating methods and practice guidelines?
- In your opinion, how much influence does the political climate have on knowledge that is transferred to practice?
- In your opinion, how much influence does the philosophical reasoning have on knowledge that is translated to practice?
- How do you decide which training is necessary and useful for practitioners?
- Who is simplifying the knowledge for trainings, how is this undertaken?
- On what grounds are decision made if the knowledge is useful, valid or true?
- Do you see that concepts and tools used are based on science?

Appendix 2:

January 2011

Dear Madams and Sirs,

Re: Interviewee Information

I am a PhD Student at the University of Edinburgh in Social Work / Science and Technology. For my data collection, I am looking for participants who are willing to be interviewed by me.

The following paragraphs briefly describe the aims and objectives of the project as well as the methods of data collection. I have also attached an Interview Schedule. The interview usually lasts one hour.

If you agree to be interviewed, I will arrange to meet you at a time and place that suits you. The interviews will be tape-recorded and short transcripts of excerpts from the interviews will be included in the dissertation. The interviews will not be used for any other purpose and the collected data will be anonymised. The transcripts of the interviews will be destroyed at the end of the PhD project.

Thank you for your interest in my PhD project. If you think that you would be willing to be interviewed, please contact me on the email address below. I am looking forward to hearing from you soon.

With Best Wishes,

Christina Plafky

Postgraduate Researcher

The University of Edinburgh, C.S.Plafky@sms.ed.ac.uk

Appendix 3:

Interviewee Information Sheet

The social problem of aggressive behaviour has become a very pressing issue in modern life. Regular media coverage about young people 'acting out' and committing violent acts is just one of many examples of the increased interest. It is therefore no surprise that (neuroscientific) research on violence and aggression receives significant funding and interest. Additionally, youth crime and particularly aggressive acts committed by young people continue to be a topic of debates amongst professionals and policy makers regarding appropriate ways of dealing with it. The debates reflect the contemporary political climate and the restraints, difficulties and uncertainties juvenile justice systems entail (Freeman, 1983). The general trend in Social Work Services to increase evidence-based practice has led to a growing interest and funding in this field (Nutley and Walter 2007). This PhD project is designed to investigate, if and how findings from brain development and (neuro-) science influence juvenile justice practice in Scotland.

The main data collection methods are interviews with practitioners and Service/Senior Management in local governments and secure units based on an investigation of policy and programme documents in use by the respective councils or resource. The knowledge base of these practitioners is the main focus of interest for this project. The professionals are relevant for either development or implementation of policies or for the practical experience with them and therefore hold valuable knowledge for the data collection. Interviews with Service/Senior Management will hopefully give insight with regards to the general political trend that underlies policy developments as well as wider expectations about the professional development of practitioners. Post-qualifying training for practitioners is offered on a local level and therefore in-depth interviews with in-house Training

Providers and in-house Training Consultants will be held. It is assumed that the Training Providers are involved in the process of translation of scientific knowledge, therefore are 'translators', and hold valuable knowledge and insight for this project. It is expected, that there will be a general pattern of knowledge translation across the councils and the different practitioners and it is hoped, that this pattern will be uncovered and it will be possible to develop a theory to describe this process.

The study aim is to explore how and if concepts from brain development and (neuro-) science inform juvenile justice practice, how those concepts are translated from research into practice and to what extend those concepts are transformed in the process of translation and adoption. The information about this will support the development of a model of the knowledge translation process. The study objective is to inform policy, training and practice in respect of knowledge translation in this specific field.

The project will try to answer the following questions:

- What is 'neuroscience' in view of juvenile justice practitioners?
- What neuroscientific concepts, theories and results do juvenile justice practitioners use in their day-to-day work? How are these employed in practice?
- How is this practitioner's knowledge similar or different to the neuroscientific findings from which it derives? How and in what ways does it differ?
- How does the process of translation between neuroscience and juvenile justice take place? What is the role of professional mediators, such as Social Work Trainers?
- How is the use of neuroscientific concepts in practice shaped by the practice context?

Interview Schedule for Practitioners

- What counts as aggressive behaviour?
- What are cues of aggressive behaviour in your opinion? Can you give practical examples?
- How do you differentiate anger-aggression-rage-violence in juveniles?
- What characterises aggressive juveniles?
- How do you response to aggressive behaviour? Can you give practical examples?
- How are where do you get knowledge about aggression for your practice?
- What theoretical concepts of aggression/violence are in use?
- What methods, tools and programmes do you use with aggressive juveniles?
- Do you see that these concepts and tools you use are based on science?
- What is neuroscience for you?

Interview Schedule for Training Providers and Facilitator:

- What counts as aggressive behaviour?
- How do you differentiate anger-aggression-rage-violence in juveniles?
- How are where do you get knowledge about aggression for your practice?
- What theoretical concepts of aggression/violence are in use?
- Do you see that these concepts and tools you use are based on science?
- Who is simplifying the knowledge for trainings that is undertaken, on what grounds are decision made if the knowledge is useful, valid and true?
- In your opinion, how much influence does the political climate have on

knowledge that is translated?

- In your opinion, how much influence does the political climate have on knowledge that is transferred?

- What is neuroscience for you?

Appendix 4:

Post-Interview Contract

{Date}

The University of
Edinburgh
School of Social and
Political Science
Chrystal Macmillan Building
15a George Square
Edinburgh
Email: c.s.plafky@sms.ed.ac.uk

RE: Research interviews concerning the translation of neuroscientific knowledge to juvenile justice practice

I, {Name of Interviewee}, agree that comments made during the course of the previous interview can be used by Christina Plafky in the course of her research and any academic publications that may ensure. I understand that all identifying details will be removed from the transcript of the interview and that Christina Plafky alone will ever listen to the recording which will eventually be deleted at the close of the project.

Please delete where appropriate:

- I do/do not wish to receive a completed copy of the transcript
- I do/do not wish to receive an advanced copy of any documents that will be published which use excerpts from the interview.

Signed	Signed
{Interviewee}	Christina Plafky

Appendix 5:

Tools and Methods in use with aggressive juveniles

Tool / Method	Function of Tool / Method	Profession of main user
DSM	Classification of mental health problems	Psychiatrist
DISC	Classification of personalities	Psychologist
Child Behaviour Checklist	Instrument to rate children's behaviour and competencies	Psychiatry, Psychologist, Parents, Teacher
SAVRY	Risk Assessment Tool for adolescence violent behaviour	Social Worker
ASSET	Assessment tool for young offenders	Social Worker
AIM 2	Assessment of strengths and concerns of young people	Social Worker
Social Behaviour Assessment Schedule	Assessment of social functioning and its impact on significant others demonstrates a number of problems in the conceptualization of role behaviour	Psychiatrist, Psychologist
Trier Social Stress Task	Stress Test	Psychiatrist, Psychologist
Novaco's model of anger management	Anger Management tool	Juvenile Justice Professionals Psychologist
Cycle of aggression	Model of aggressive and violent behaviour (Kepler and Wheeler)	Juvenile Justice Professionals

Appendix 5:

Recommendations for policymakers, practitioners, university teaching staff and knowledge entrepreneurs and training providers

- Enhancement of knowledge in the field of aggressive behaviour for practitioners as well students of social work: this includes a clearer definition of 'aggressive behaviour' in the context of practice as well as research;
- Clearer consideration within the research publications of what aggressive behaviour means in practical settings;
- Enhancement of knowledge on critical evaluation of knowledge from other disciplines in the form of advanced training through in-house training as well as university courses;
- Increase of knowledge on evidence-based practice and concepts for critically examining research knowledge to empower practitioners and training providers by universities and employers
- Learning development officers/intervention developers employed by the councils/organisations who develop intervention strategies based on a critical examination of research and practical experiences;
- Acknowledgement by employers, politicians and training providers of the responsibilities of training providers in respect of the 'sandwich position';
- Shift in thinking towards own practice/abilities/professional identity as well as the advancement of a professional identity of social work practitioners through knowledge exchange settings, peer group reviews and discussions/workshops by employers, politicians and policymakers as well as universities;
- Acknowledgement, appreciation and actual support by politicians and policymakers that working in a children and families setting requires a vast amount of knowledge from different disciplines, and a constant

development of the individual knowledge base, an ability to critical question knowledge and the ability and time to reflect on individual cases and knowledge in day-to-day practice. This specifically requires the time and support from employers and therefore additional resources for practice.